03/01/2001

CONTRACT DOCUMENTS

FOR THE

ASARCO EAST HELENA PLANT

CAMU (RCRA LANDFILL) - PHASE 1 CELL CONSTRUCTION PROJECT

- FINAL –

MARCH 2001

Prepared for:

ASARCO Incorporated
Mr. John Shaw, Plant Manager
P. O. Box 1230
East Helena, MT 59635

I hereby certify that the Project Drawings and the Contract Documents were prepared by me or under my direct supervision and that I am a duly registered Engineer under the laws of the State of Montana.

Michael J. Oelrich, Project Engineer

Prepared by:

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601

(406) 443-4150 Phone
(406) 443-1252 Fax

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FOR THE

ASARCO EAST HELENA PLANT

CAMU (RCRA LANDFILL) - PHASE 1 CELL CONSTRUCTION PROJECT

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SECTION I

INVITATION TO BID

SECTION I

INVITATION TO BID

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601
Phone: (406) 443-4150

ASARCO Incorporated
P. O. Box 1230
East Helena, MT 59635
Phone: (406) 227-7100

GENERAL

Sealed Bids will be received by ASARCO Incorporated, ATTN: Joe Terrio, P.O. Box 1230, East Helena, Montana 59635 until 10:00 a.m. local time, Thursday, November 30, 2000, for the Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project.

Bids received after this time will not be accepted and will be returned unopened. Bidders assume all risk of late delivery regardless of fault.

DESCRIPTION OF WORK

This Project includes the work generally described as follows:

- Construct a Resource Conservation and Recovery Act (RCRA) Landfill Load, Transport, Place and Compact Source Area (contaminated) Soils and Construction Debris in Landfill
- Construct the closure of Landfill
- Construct associated surface water and erosion controls, access road improvements (railroad crossing improvements), vegetation of newly constructed and disturbed areas, facility fencing, health and safety requirements, site access and haul controls (including traffic control) and construction surveys.

REGULATIONS

Owner proposes to construct this landfill in accordance with 40 CFR 264 and EPA guidance ("Seminar Publication, Requirements for Hazardous Waste Landfill Design, Construction and Closure" and "Construction Quality Management for Remedial Action and Remedial Design Waste Containment Systems").

DOCUMENTS

Construct the landfill per this document, the Contract Documents, which contains 149 pages and the Project Drawings titled "Project Drawings for the ASARCO Incorporated, East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project at East Helena Smelter".

The Project Drawings consist of 14 design sheets and are numbered 08-1-9970 through 08-1-9983.

BIDS

Copies of Project Drawings and the Contract Documents are on file and may be examined at the following locations:

ASARCO Incorporated	Hydrometrics, Inc.
East Helena Smelter	2727 Airport Road
East Helena, MT 59635	Helena, MT 59601

REQUIREMENTS

Each Bidder shall have a valid Montana Contractor's License.

RESERVATION

ASARCO Incorporated reserves the right to reject any or all Bids, and to waive any informalities or irregularities therein.

END OF SECTION

SECTION II

INSTRUCTIONS TO BIDDERS

SECTION II

INSTRUCTIONS TO BIDDERS

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601
Phone: (406) 443-4150

ASARCO Incorporated
P. O. Box 1230
East Helena, MT 59635
Phone: (406) 227-7100

PART 1 - DEFINED TERMS

1.01 Standard Specifications - The Standard Specifications for Road and Bridge Construction, edition of 1995, prepared by the Montana Department of Transportation and Montana Transportation Commission, hereinafter referred to as the "Standard Specifications", shall govern this Project and form the basis of this Contract, except as modified in these Contract Documents. Contractor shall note the 1995 Standard Specifications shall be used as modified herein without subsequent amendments or newer publications made by the Montana Department of Transportation and Montana Transportation Commission. The Standard Specifications are modified by the Special Provisions of these Specifications as detailed in the following divisions. Division and subdivision numbers refer to corresponding numbers of the Standard Specifications. Additional division or sections numbers may be used to specify items of work not included in the Standard Specifications.

Terms used in these Instructions to Bidders that are defined in the General Provisions have the meanings assigned to them in the General Provisions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a Bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible, responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

The following terms employed in the Contract Documents shall, for the purpose of this Contract, have the following meanings:

"Contracting Agency" or "Owner" shall mean ASARCO Incorporated.

"MDT", "Department" or "Department of Transportation" shall mean ASARCO Incorporated.

"Engineer" or "Project Engineer" - shall mean Hydrometrics, Inc., the project designer, who is to act as Asarco's construction representative.

Copies of the 1995 Standard Specifications may be obtained from Montana Department of Transportation, Contract Plans Section, 2701 Prospect Avenue, P.O. Box 201001, Helena, Montana 59620-1001, Telephone (406) 444-6215.

PART 2 - COPIES OF CONTRACT DOCUMENTS

2.01 Complete copies of the Project Drawings and Contract Documents for use in preparing Bids may be obtained in accordance with the Invitation to Bid.

2.02 No partial sets of Bidding Documents will be issued. Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the work and do not confer a license or grant for any other use.

PART 3 - QUALIFICATIONS OF BIDDERS

3.01 Bidders have submitted evidence that they have a practical knowledge of the particular work bid upon, and that they have the financial resources to complete the proposed work. In evaluating the Bidder's qualifications, the following factors will be considered: work previously completed by the Bidder, similar work completed by the Bidder and whether the Bidder (a) maintains a permanent place of business, (b) has adequate plant and equipment to do the work properly and expeditiously, (c) has the financial resources to meet all obligations incident to the work, and (d) has appropriate technical experience. Each Bidder must show that the Bidder has handled former work of a similar nature and that no just claims are pending against such work. No Bid will be accepted from a Bidder who is engaged in any work that would impair Bidder's ability to perform or finance this work.

3.02 Each Bidder shall type or write in a legible manner Bidder's Montana Contractor's license number on the outside of the envelope or wrapper that contains the Bid and in the space provided on the Bid Form.

PART 4 - NOT USED

PART 5 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

5.01 It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site and become familiar with local conditions that may affect cost, progress, performance, or furnishing of the work, (c) consider federal, state, and local laws and regulations that may affect cost, progress,

performance, or furnishing of the work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors, or discrepancies in the Contract Documents.

5.02 Information about subsurface conditions at the site is available from the Engineer. This information and copies of other such reports and drawings, if any, will be made available by the Engineer to any Bidder on request, and upon payment of the cost of reproduction and mailing of such reports and drawings.

5.03 Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the site are based upon information and data furnished to the Owner and Engineer by the owners of such underground facilities or others, and the Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Special Provisions.

5.04 Reports and drawings, if any, referred to in Paragraphs 5.02, 5.03, 5.04 are not part of the Contract Documents, but the technical data contained therein upon which Bidder is entitled to rely are incorporated therein by reference. Such technical data, if any, have been identified and established in the Contract Documents.

5.05 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground facilities, other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Section 104.02 of the General Provisions.

5.06 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data that pertain to the physical conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise that may affect cost, progress, performance, or furnishing of the Work and that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

5.07 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, and clean up and restore the site to its former condition upon completion of such explorations.

5.08 The lands upon which the work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.

5.09 Access to the site may be arranged by contacting Sanna M. Yost, Project Engineer, at telephone number (406) 443-4150 ext. 172. In general, site access will be limited to normal working hours.

5.10 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Part; that without exception the Bid is premised upon performing and furnishing the work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents; and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the work.

5.11 Portions of this Contract include tasks that involve hazardous and/or regulated waste. During the performance of these tasks, the Contractor is responsible for the compliance with all appropriate regulations and safety standards.

PART 6 - INTERPRETATIONS AND ADDENDA

6.01 All questions about the meaning or intent of the Contract Documents are to be submitted to the Engineer. Replies will be issued only by Addenda. Questions received less than seven (7) days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6.02 Addenda may also be issued to modify the Bidding Documents as deemed advisable by the Owner or Engineer.

6.03 Addenda will be mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. No Addenda will be issued later than four (4) days prior to the date for opening of Bids except an Addendum, if necessary, postponing the date for opening of Bids or withdrawing the request for Bids.

PART 7 - PRE-BID CONFERENCE

7.01 A pre-bid conference will be held at Asarco East Helena Plant Engineering Office at 10:00 a.m. local time, October 26, 2000. The representatives of Owner and Engineer will be present to answer questions. Any questions that, in the opinion of Engineer, cannot be answered by direct reference to the Bidding Documents will be answered by formal written Addenda as outlined above under Interpretations and Addenda.

7.02 The pre-bid conference will include a tour of the site of the work conducted by representatives of Owner and Engineer. All interested parties are encouraged to attend.

PART 8 - BASIS OF BIDS

8.01 The Bidder shall submit a single total bid price as required by the Bid Form.

PART 9 - CONTRACT TIME

Because of availability of funding, the field work to be performed under this Contract shall begin on or after March 26, 2001, shall be substantially completed as defined in Part 5 of Section VIII by November 1, 2001 and fully and finally completed by December 1, 2001, plus any applicable extensions of time granted by the Owner. Project work will be suspended during significant precipitation events or when such events cause muddy site conditions. The Contractor must allow for weather shut downs in the project schedule. Contract time will not be extended because of weather and associated site conditions. Work will only be allowed during daylight hours.

PART 10 - LIQUIDATED DAMAGES – NOT USED

PART 11 - SUBSTITUTE MATERIAL AND EQUIPMENT

11.01 Whenever a material or article is specified or described by using the name of a proprietary product or the name of a particular manufacturer or vendor, the specified item mentioned shall be understood as establishing the type, function, and quality desired. Except for those items identified in the Specifications for which substitute material or equipment will not be accepted, other manufacturers' products will be accepted provided sufficient information is submitted to allow Engineer to determine that the products submitted are equivalent to those named. Applications for such review will not be considered by Engineer until after the "effective date of the Agreement." The procedure for submittal of any such application by Contractor and consideration by Engineer is set forth in the General Conditions, which are supplemented in the Special Provisions and in the General Requirements of each specification.

PART 12 - BID FORM

12.01 The Bid Form is attached hereto; additional copies may be obtained from the Engineer. The Bid Form will be modified as required and, if modified, will be issued in its entirety by Addendum.

12.02 Completion of the Bid Form must be done in ink or by typewriter. The Bid Total Price on the form must be stated in words and numerals; in case of a conflict, words will take precedence.

12.03 Bid by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign), and the corporate seal must be affixed and attested by the secretary or an assistant

secretary. The corporate address and state of incorporation shall be shown below the s signature.

12.04 Bid by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature. The official address of the partnership must be shown below the signature.

12.05 Bid by joint ventures shall be signed by each participant in the joint venture or by an authorized agent of each participant.

12.06 The names of all persons signing must also be legibly printed or typed below the signature. A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the Bid of the individual signing. When requested by Owner, evidence of the authority of the person signing shall be furnished.

12.07 List the full name of each person or company interested in the Bid on the Bid Form.

12.08 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

12.09 No alterations in Bids, or in the printed forms therefore, by erasures, interpolations, or otherwise will be acceptable unless each such alteration is signed or initialed by the Bidder. If initialed, Owner may require the Bidder to identify any alteration so initialed. No alteration in any Bid, or in the form on which it is submitted, shall be made after the Bid has been submitted.

12.10 Show the address to which communications regarding the Bid are to be directed.

12.11 Complete and submit the noncollusion affidavit in its entirety, with the Bid.

PART 13 - SUBCONTRACTOR LISTING

13.01 Each Bidder shall list on the form provided: the name and the address of each subcontractor who will perform work or labor or render service to the Bidder in or about the work in an amount in excess of $10,000; and the portion of the work that will be done by each subcontractor listed. Qualifications and references will be provided for each subcontractor listed.

13.02 If a Bidder fails to specify a subcontractor for any portion of the work to be performed under this Contract in excess of $10,000, he agrees to perform that portion himself. No subcontractor doing work in excess of $10,000 and who is not listed will be used without the written approval of the Owner.

PART 14 - EQUIPMENT/MATERIAL SUPPLIER LISTING

14.01 Each Bidder shall list on the form provided the name of the manufacturers or suppliers of the items of equipment and materials listed on the form that Bidder proposes to furnish. Upon award of the Contract, the named equipment shall be furnished. Substitutions will be permitted only if named equipment does not meet the Specifications, the manufacturer is unable to meet delivery requirements of the construction schedule, or by mutual agreement of Owner and Contractor. This form is located in Section V, Subcontractor and Equipment/Material Supplier Listings.

14.02 Preliminary acceptance of equipment listed by manufacturer's name shall not in any way constitute a waiver of the Specifications covering such equipment; final acceptance will be based on full conformity with the Specifications covering the equipment.

14.03 Failure to furnish all information requested may be cause for rejection of the Bid.

PART 15 - SUBMISSION OF BIDS

15.01 Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be included in an opaque sealed envelope addressed to ASARCO Incorporated, Joe Terrio, East Helena Plant, P.O. Box 1230, East Helena, MT 59635 and identified on the outside with the Bidder's name, license number, and address; the time and date of the Bid opening; and with the words "Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project".

15.02 All other required documents shall accompany each Bid.

15.03 If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof.

15.04 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Invitation to Bid or the modified time and date indicated by Addendum. Bids received after the time and date for receipt of Bids will be returned unopened. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

15.05 Oral, telephone, facsimile or telegraph Bids are invalid and will not receive consideration. No Bidder may submit more than one Bid. Multiple Bids under different names will not be accepted from one firm or association.

PART 16 - MODIFICATION AND WITHDRAWAL OF BIDS

16.01 Bids submitted early may be modified or withdrawn by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or be by telegram. If by telegram, written

confirmation over the signature of Bidder must have been mailed and postmarked on or before the date and before time set for receipt of Bids; it shall be so worded as not to reveal the amount of original Bid. Bids may also be modified or withdrawn in person by the Bidder or an authorized representative provided identity and authority can be proven. Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

16.02 If, within 24 hours after Bids are opened, any Bidder files a duly signed written notice with the Owner and promptly thereafter demonstrates to the reasonable satisfaction of the Owner that there was a material and substantial mistake in the preparation of the Bid, the Bidder may withdraw the Bid. Thereafter, that Bidder will be disqualified from further bidding on the work.

PART 17 - OPENING OF BIDS

17.01 Asarco will open bids and notify bidders of the results within 7 days of the bid due date.

PART 18 - BIDS TO REMAIN OPEN

18.01 All Bids shall remain open and subject to acceptance for the period of time specified in the Bid Form, but the Owner may, in its sole discretion, release any Bid prior to that date.

PART 19 - AWARD OF CONTRACT

19.01 The Owner reserves the right to reject any and all Bids, to waive any and all informalities, to negotiate Contract terms with the Successful Bidder, and to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. The Owner reserves the right to reject the Bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified, of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Owner. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum or product of figures and the correct sum or product thereof will be resolved in favor of the correct or product sum.

19.02 The Owner reserves the right to reject all Bids if the lowest, responsive Bid exceeds the funds estimated by the Owner to be available.

19.03 In evaluating Bids, the Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternates and unit prices if requested in the Bid Form.

19.04 The Owner may consider the qualifications and experience of subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the work as to which the identity of subcontractors and other persons and organizations must be submitted as provided in the Special Provisions. Operating costs, maintenance considerations, performance data, and guarantees of materials and equipment may also be considered by the Owner.

19.05 The Owner may conduct such investigations as he deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of the Bidders, proposed subcontractors, and other persons and organizations to do the work in accordance with the Contract Documents to the Owner's satisfaction within the prescribed time.

19.06 The Owner reserves the right to reject the Bid of any Bidder that does not pass evaluation to the Owner's satisfaction.

19.07 If the Contract is to be awarded, it will be awarded to the lowest, responsive, responsible, qualified Bidder whose evaluation by the Owner indicates to the Owner that the award will be in the best interest of the Project.

19.08 If the Contract is to be awarded, the Owner will give the Successful Bidder a Notice of Award within the time specified in the Bid Form for Bids to remain open.

PART 20 - PERFORMANCE AND OTHER BONDS – NOT USED

PART 21 - SIGNING OF AGREEMENT

21.01 When the Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by unsigned counterparts of the Agreement and all other Contract Documents as indicated in this Document.

21.02 Two copies of the Agreement will be prepared by the Engineer. Both copies will be submitted to the Contractor, and the Contractor shall execute the Contract Agreement, insert Certificates of Insurance, and submit all copies to the Owner within 10 days. The date of Contract on the Contract shall be left blank for filling in by the Owner.

21.03 The Owner will execute all copies, insert the date of Contract on the Contract and transmit all copies to the Engineer within 10 days for review and distribution. Distribution of signed copies will be one copy each to the Owner, and the Contractor.

21.04 There shall be no Contract between the Bidder and the Owner until the Agreement in the Contract Documents is signed by the Owner.

PART 22 - BID TO INCLUDE ALL COSTS

22.01 Bidders shall include in their Bid the cost for obtaining and paying for any patent fees, royalties, permits, utilities, taxes, and anything else called out in the Bidding Documents to be obtained and/or paid for by the Contractor.

PART 23 - WORKER HEALTH AND SAFETY

23.01 It is the Contractor's responsibility for implementing a safety program to protect workers from all health and safety hazards associated with this project. The Contractor is responsible for compliance with all applicable OSHA regulations and compliance with the Asarco East Helena Plant health and safety rules and regulations. Plant health and safety rules and regulations will be reviewed at the pre-bid conference.

23.02 Tasks involved with the waste placement phase of this project may potentially expose workers to lead, arsenic and/or cadmium. The Contractor is responsible for compliance with OSHA's lead, cadmium, and arsenic standard (29 CFR 1926.62, 1127, and 1118) when performing work associated with these tasks. The Owner provides guidance to Contractors for compliance with these standards through its Contractor Safety Program. All Contractor crew members must attend a 2-hour Contractor Safety Program Training session provided by the Owner. The Contractor is responsible for all labor expenses for his crews associated with worker Health and Safety training and testing. The Contractor is responsible for compliance with these standards and will need to provide a written statement to the Owner that they are in full compliance with OSHA's lead, cadmium, and arsenic standard. The Contractor is also responsible for performing work in accordance with the HAZWOPER standard (29 CFR 1926.65). Adherence to the above-mentioned standards is only required during the Waste Placement Phase and topsoil, removal, stockpile and replacement tasks of this project.

23.03 Minimum personal protective equipment (PPE) required for the Waste Placement Phase and topsoil removal, stockpile and replacement tasks of this project includes an approved hard hat, safety glasses, steel-toed boots, coveralls, respirator, orange safety vest and work gloves. The Owner will supply coveralls, respirators and respirator fit tests. The Owner will launder coveralls and clean and maintain respirators. The Contractor is responsible to provide all other PPE stated above, and any other PPE that may be required to complete the work (hearing protection, face shields, etc.) for all project phases.

23.04 The Owner will provide a change room, shower facility and a lunchroom during the Waste Placement Phase and topsoil removal, stockpile and replacement tasks of the project. During construction activities involving exposure to regulated wastes, workers will be required to shower at the end of each shift. Showers are to be completed during, not after, employee work shifts.

23.05 The Contractor is responsible for the worker's medical monitoring program. For Contractor crew members working on this site for more than 30 days, an initial medical examination and biological monitoring is required by the OSHA arsenic, cadmium, and lead standards. For Contractor workers on the site 30 days or less, only an initial blood lead analysis is required per the OSHA lead standard. The Contractor will bear the expenses of required medical exams and testing, and subsequent blood lead testing/monitoring according to the lead standard. It will be the Contractor's responsibility to schedule the required testing for his crew.

23.06 The Contractor will submit written reports to the Owner for any and all injuries or illnesses resulting in medical care, fatalities, equipment damage, and all incidences (near misses) which could have caused an injury/illness requiring medical care or fatality.

23.07 The Contractor is responsible for compliance with DOT Regulation 49 CFR Part 382 "Controlled Substance and Alcohol Use and Testing" for all the Contractor's employees operating a commercial motor vehicle subject to 49 CFR Part 383 "Commercial Driver's License Standards."

23.08 Tasks involved with the waste placement phase of this project may potentially expose workers to asbestos. The Contractor is responsible for compliance with OSHA's asbestos standard (29 CFR 1926.1101). The Contractor will notify the Owner if material containing asbestos is uncovered. The Owner or his representative will perform project work involving asbestos.

PART 24 - OTHER REQUIREMENTS

24.01 Bidder shall inform itself of, and Successful Bidder shall comply with, Federal, State, and local laws, statutes and ordinances relative to the execution of the work. This requirement includes, but is not limited to, applicable regulations concerning minimum wage rates, nondiscrimination in the employment of labor, protection of public and employee health and safety, environmental protection, the protection of natural resources, fire protection, burning and nonburning requirements, permits, fees, and similar subjects.

END OF SECTION

SECTION III

BID FORM

SECTION III

BID FORM

To: ASARCO Incorporated
East Helena Plant
P. O. Box 1230
East Helena, MT 59635

RE: ASARCO EAST HELENA PLANT CAMU (RCRA) LANDFILL) - PHASE 1 CELL CONSTRUCTION PROJECT BID

Attention: John Shaw, Plant Manager

THE UNDERSIGNED BIDDER, having familiarized himself with the work required by the Contract Documents, the site where the work is to be performed, local labor conditions, and all laws, regulations, and other factors affecting performance of the work, and having satisfied himself of the expense and difficulties attending performance of the work.

HEREBY PROPOSES and agrees, if this Bid is accepted, to enter into Agreement in the form attached to perform all work, including the assumption of all obligations, duties, and responsibilities necessary to the successful completion of the Contract and the furnishing of all materials and equipment required to be incorporated in and form a permanent part of the work; tools, equipment, supplies, transportation, facilities, labor, superintendence, and services required to perform the work; and insurance and submittals; all as indicated or specified in the Contract Documents to be performed or furnished by Contractor for the following unit prices:

The Total Bid Price of this Proposal shall be the sum of the itemized Bid items on the following Bid Sheets (itemized prices are all inclusive).

The Contract amount shall be the total price of the Bid Schedule. Correct extensions based on the unit prices bid and the approximate quantities shown are for the comparison of Bids only and payments for unit priced items will be based on actual quantities measured in accordance with the requirements of the Contract Documents. Limits of lump sum priced items will be as described in the Project Drawings and Contract Documents.

The undersigned has checked the above amounts and understands that the Owner will not be responsible for any errors or omissions on the part of the undersigned in making up this Bid.

In order for the Owner to consider a Bid, all items on the Bid must be filled in completely.

The undersigned Bidder agrees to obtain required insurance, and to enter into a Contract within the time specified in the Instructions to Bidders, and further agrees to complete all work covered by the Bid, in accordance with specified requirements, within the time specified in the Agreement.

ASARCO EAST HELENA
CAMU - PHASE 1 CELL CONSTRUCTION PROJECT
BID SCHEDULE

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	LS	XXX	$
2	Culvert, 30" x 51" CMP Arch	58	LF	$	$
3	Culvert, 42" diameter CMP	66	LF	$	$
4	Access Roads	1	LS	XXX	$
5	Railroad Crossing Improvements	1	LS	XXX	$
6	Temporary Erosion Controls	1	LS	XXX	$
7	Excavation & Stockpile	67,500	CY	$	$
8	Subgrade Preparation, Grade & Compact	23,500	SY	$	$
9	Compacted Clay Liner	22,500	CY	$	$
10	HDPE, 60 mil	44,500	SY	$	$
11	Drainage Geonet, 250 mil	44,500	SY	$	$
12	Geotextile Construction Fabric	23,500	SY	$	$
13	Leachate Collection & Removal Systems	1	LS	XXX	$
14	Runoff Control Pond	1	LS	XXX	$
15	Health & Safety Requirements	1	LS	XXX	$
16	Site Access & Traffic Controls	1	LS	XXX	$
17	Dust Control	1	LS	XXX	$
18	Haul Road Maintenance	1	LS	XXX	$
19	Load, Haul, Place & Compact Waste Materials	113,000	CY	$	$
20	Gas Migration Layer	1,750	CY	$	$
21	Compacted Clay Cover	15,800	CY	$	$
22	HDPE, 40 mil	23,500	SY	$	$
23	Cap Drainage Collection, 4" HDPE	1,900	LF	$	$
24	Drainage Layer Sand	8,500	CY	$	$
25	Cap Drainage Culvert, 6" HDPE	74	LF	$	$
26	Cover Soil Layer	18,300	CY	$	$
27	Permanent Run-on Diversion Ditches	750	LF	$	$
28	Seed, Fertilize, & Mulch – Off Plant	11.5	ACRE	$	$
29	Seed & Mulch – Agricultural	8.5	ACRE	$	$
30	Chain Link Fence with Appurtenances	2,400	LF	$	$
31	Construction Surveys	1	LS	XXX	$
32	Quality Control Plan and Management	1	LS	XXX	$
33	Compacted Clay Cap at Former Southeast Stockpile Area	6,000	CY	$	$
TOTAL BID (PRICE IN FIGURES)					
TOTAL BID (PRICE IN WORDS)					

Receipt of copies of the following addendum(s) is hereby acknowledged.

Addendum No. Acknowledged	Bidder's Signature	Date
1		
2		
3		
4		

All addenda received have been considered in preparation of this Bid.

Enclosed herewith are the Noncollusion Affidavit, Subcontractor and Equipment/Material Supplier Listing, Subcontractor Statements of Qualifications and the Summary of Insurance Requirements.

In submitting this Bid, it is understood that the right is reserved by Owner to reject any and all Bids, and it is understood that this Bid may not be withdrawn during a period of 120 days after the scheduled time for the opening of Bids. It is understood that:

1. The Owner will provide a Notice of Award within 7 days of the bid opening;
2. Field work will not start prior to March 26, 2001 because of availability of funding;
3. Contract Agreements will begin being processed in mid-February 2001;
4. Contract Agreements will be finalized on or about March 23, 2001;
5. Contract submittals must be submitted in accordance with the contract documents;
6. Bids should reflect all costs to carry out the project work specified in the contract documents. No additional payments will be allowed for potential material, labor and equipment price increases between the bid opening and execution of the contract;
7. Because project funding will not be available until late March 2001, the first pay request will not be submitted before April 1, 2001. The first pay request will include compensation for non-field project work (submittals) completed prior to pay request submittal and reimbursement for materials stored on site prior to pay request submittal. No payments for project work or materials on site will be issued prior to April1, 2001.

Montana law requires that all Contractors must be registered with the Construction Contractors Board in order to submit a bid to do work and to do work as a Contractor. The undersigned Bidder states that it is now registered with the _____.

Indicate the Bidder's registration no. _____.

The undersigned Bidder hereby certifies: (a) that this Bid is genuine and is not made in the interest of, or in the behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; (b) that Bidder has not directly or indirectly induced or solicited any other Bidder

to put in a false or sham Bid; (c) that Bidder has not solicited or induced any person, firm, or corporation to refrain from Bidding; and (d) that Bidder has not sought by collusion to obtain any advantage over any other Bidder or over the Owner.

The Bidder further agrees that he has exercised his own judgment regarding the interpretation of subsurface information and has utilized all data which he believes pertinent from the Engineer, Owner, and other sources in arriving at his conclusions.

The full names and addresses of parties interested in this Bid as principals are as follows:

_____

_____

_____

_____

SIGNATURE OF BIDDER:

Date: _____

If an Individual: _____, doing

business as _____.

If a Partnership: _____

by _____, partner.

If a Corporation: _____

(a _____ Corporation)

by _____

(SEAL & Title _____ ATTEST)

Business Address of Bidder _____

MT Contractor's License Number: _____

If Bidder is a joint venture, other party must sign below.

Date: _____

If an Individual: _____, doing

business as _____.

If a Partnership: _____

by _____, partner.

If a Corporation: _____

(a _____ Corporation)

by _____

(SEAL & Title _____ ATTEST)

Business Address of Bidder _____

MT Contractor's License Number: _____

END OF SECTION

SECTION IV

NONCOLLUSION AFFIDAVIT

SECTION IV

NONCOLLUSION AFFIDAVIT

State of _____)
County of _____)

Reference: Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

I state that I am _____ (Title) of _____ (Name of Firm) and that I am authorized to make this affidavit on behalf of this firm and its owners, directors, and officers. I am the person responsible in this firm for the price(s) and the amount of this Bid.

I state that:

(1) The price(s) and amount of this Bid have been arrived at independently and without consultation, communication or agreement with any other Contractor, Bidder, or potential Bidder, except as disclosed on the attached appendix.

(2) That neither the price(s) nor the amount of this Bid, and neither the approximate price(s) nor approximate amount of this Bid, have been disclosed to any other firm or person who is a Bidder or potential Bidder, and they will not be disclosed before Bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this Contract, or to submit a Bid higher than this Bid, or to submit any intentionally high or noncompetitive Bid or other form of complementary Bid.

(4) The Bid of this firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive Bid.

(5) _____ (name of this firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that _____ (name of this firm) understands and acknowledges that the above representations are material and important, and will be relied on by the Owner in awarding the Contract(s) for which this Bid is submitted. I understand and this firm understands that any misstatement in this affidavit is and shall be

treated as fraudulent concealment from ASARCO Incorporated of the true facts relating to the submission of Bids for this Contract.

_____

SIGNATURE

_____

NAME OF COMPANY/POSITION

Sworn to and subscribed before me this _____ day of _____, 2000.

_____

NOTARY PUBLIC FOR MONTANA

_____

Address

_____

City, State and Zip

This commission expires _____

END OF SECTION

SECTION V

SUBCONTRACTOR AND EQUIPMENT/MATERIAL

SUPPLIER LISTINGS

SECTION V

SUBCONTRACTOR LISTING

The following information is submitted which gives the name, business address, and portion of the work for each subcontractor that will be used for a portion of the work equal to or exceeding the amount specified in the Instructions to Bidders if the Bidder is awarded the Contract. Additional numbered pages shall be attached to this page as required. Each page shall be headed "SUBCONTRACTOR LISTING" and signed. Qualifications showing that subcontractors have installed work of similar nature and a minimum of three (3) references must be provided for each subcontractor per specifications.

Name	Business Address	Approximate Value of Subcontract	Description of Portion of Work to be Performed

SECTION V

EQUIPMENT/MATERIAL SUPPLIER LISTING

EQUIPMENT/MATERIAL ITEM: 60- and 40-MIL HDPE LINERS

The following contains the name, business address, and the equipment or material that the Contractor will use on the project site. Substitution of items require approval of the Engineer per Part 14 of the Instructions to Bidders.

Name of Product: _____

Business Contact: _____

Business Address: _____

Business Contact Phone Number: _____

Description of Product: _____

_____

_____

_____

_____

Note: 1. Enclose product brochure (if applicable)

SECTION V

EQUIPMENT/MATERIAL SUPPLIER LISTING

EQUIPMENT/MATERIAL ITEM: GEONET

The following contains the name, business address, and the equipment or material that the Contractor will use on the project site. Substitution of items require approval of the Engineer per Part 14 of the Instructions to Bidders.

Name of Product: _____

Business Contact: _____

Business Address: _____

Business Contact Phone Number: _____

Description of Product: _____

_____

_____

_____

_____

Note: 1. Enclose product brochure (if applicable)

END OF SECTION

SECTION VI

SUMMARY OF INSURANCE REQUIREMENTS

SECTION VI

SUMMARY OF INSURANCE REQUIREMENTS

(THIS FORM MUST BE SIGNED AND RETURNED WITH BID)

Project: Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

The Contractor shall, for the mutual protection and benefit of both Owner and Contractor, procure, pay for and maintain in full force and effect, at all times during the performance of the work and until final acceptance of the work, policies of insurance issued by carriers acceptable to Owner.

Contractor shall deliver to Owner along with the signed Contract and prior to any equipment or personnel being brought onto Owner's premises in accordance with the terms of this Contract, a Certificate of Insurance evidencing the coverages with limits not less than those specified below. Such Certificate, with the exception of Workers' Compensation, shall name Owner, its subsidiaries, directors, officers, agents and employees as additional insured and shall expressly provide that the interest of same therein shall not be affected by any breach by Contractor of any policy provision for which such Certificate evidences coverage. Further, such Certificate shall expressly provide that no less than thirty (30) days prior written notice shall be given Owner in the event of material alteration to or cancellation of the coverages evidenced by such Certificate.

The Owner requires that suppliers and Contractors procure, pay for and maintain insurance coverage in full force and effect at all times during the performance of work, including construction, inspection and delivery on the Owner's property. The following is a summary of insurance provisions which will be required by Contract. Please review the General Conditions, Special Provisions and the Contract for insurance provisions.

The following coverage is required:

Worker's Compensation	Statutory
Employer's Liability	$500,000
Comprehensive General Liability	$2,000,000 per occurrence
Comprehensive Automobile Liability	$2,000,000 per occurrence

Upon renewal of each policy, Contractor shall provide to Owner a certificate of insurance evidencing all of the provisions specified in this Article.

Contractor will maintain the original of all policies, endorsements and certificates, and provide Owner with copies of same upon request of Owner.

I have reviewed the preceding provisions and have discussed both cost and availability of these insurance requirements with my insurance broker/agent. The Bid which I am submitting accurately reflects the cost and availability of the insurance requirements as outlined herein, which I will abide by if awarded the Contract.

_____ _____

(Signature) (Date)

_____

(Company)

END OF SECTION

SECTION VII

NOTICE OF AWARD

SECTION VII

NOTICE OF AWARD

TO:

DATE:

PROJECT: Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

ASARCO Incorporated has considered the Bid submitted by you November 30, 2000 for the above-described work. You are hereby notified that your Bid has been accepted for the lump sum amount of $_____.

You are required to execute the Agreement and to provide ASARCO Incorporated with certificates of insurance as outlined in the Bidding Documents.

If you fail to execute said Agreement and provide ASARCO Incorporated with the required insurance certificates as defined in the Bidding Documents, ASARCO Incorporated will be entitled to consider same as abandonment of all rights and default of all obligations arising out of their acceptance of your Bid. ASARCO Incorporated will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to Mr. Joe Terrio, P.O. Box 1230, East Helena, MT 59635.

Dated this _____ day of _____, 2000.

OWNER

ASARCO Incorporated

By: _____
John Shaw

Plant Manager, East Helena Plant
Title

ACKNOWLEDGMENT OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by Contractor.

By: _____

_____
Title

END OF SECTION

SECTION VIII

AGREEMENT FORM

SECTION VIII

AGREEMENT FORM

CONTRACT FOR

CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

at ASARCO Incorporated East Helena Lead Smelter facility

at East Helena, Montana

THIS AGREEMENT made the _____ day of _____, 2000, by and between _____, whose address is _____ (hereinafter called the "Contractor") and ASARCO Incorporated, a corporation of the State of New Jersey, whose address is 180 Maiden Lane, New York, New York 10038 and ASARCO Incorporated, P. O. Box 1230, East Helena, MT 59635, hereinafter called the "Owner").

W I T N E S S E T H :

The Contractor and the Owner, for the consideration hereinafter named, agree as follows:

PART 1 - SCOPE OF THE WORK

The Contractor shall furnish all plans, shop drawings, field engineering, labor, materials, transportation, tools, equipment and other facilities, except such items as are hereinafter listed as being furnished or furnished and installed by the Owner, required for construction of CAMU (RCRA Landfill) Phase 1 Cell Construction Project at the Asarco East Helena Lead Smelter Plant of the Owner located at East Helena, Montana.

All in accordance with the requirements and provisions of the attached "General Provisions of the Contract" and the Drawings and Specifications listed below and those Drawings and Specifications which may be supplied by the Owner or prepared by the Contractor at the Owner's direction subsequent to the execution hereof and approved by the Owner, all of which are incorporated herein by reference, made a part hereof and, together with this Agreement, hereinafter referred to collectively as the Contract:

SPECIFICATIONS: Contract Documents for ASARCO Incorporated, East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

DRAWINGS: Projects Drawings for Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

Drawing Numbers 08-1-9970 through 08-1-9983

PART 2 - TIME OF COMPLETION

A. The work to be performed under this Contract shall be commenced as soon as weather will permit in 2001 and shall be completed by November 1, 2001. Project work will be suspended during significant precipitation events or when such events cause muddy site conditions. The Contractor must allow for weather shut downs in the project schedule. Contract time will not be extended because of weather or associated site conditions. Work will only be allowed during daylight hours. Extension of time for completion shall be allowed for any delays in the progress of the work caused by strikes and other labor disputes, act or neglect of the Owner or of his employees or by other Contractors employed by the Owner, act of Government, delay in the furnishing of plans and necessary information by the Owner, or by any other cause which in the opinion of the Owner entitles the Contractor to an extension of time. The Contractor shall notify the Owner in writing within five (5) days of any occurrence which in the Contractor's opinion entitles him to an extension of time for completion.

B. Failure to complete the work within the time stated in this Article including any extension allowed pursuant hereto, shall entitle the Owner to deduct from the monies due to the Contractor as liquidated damages an amount equal to $0.00 for each calendar day of delay in the completion of the work.

C. If the Contractor completes the entire work covered by this Contract earlier than the date determined in accordance with Paragraph (a), the Owner shall pay the Contractor an additional amount equal to $0.00 for each calendar day by which the time of completion so determined has been reduced.

PART 3 – THE CONTRACT PRICE

The Owner shall pay the Contractor for the performance of this Contract, subject to any additions and deductions herein provided for the sum _____dollars ($_____), lawful money of the United States of America, at the time and in the amount hereinafter provided.

PART 4 - PROGRESS PAYMENTS

As soon as practicable after the first day of each calendar month the Contractor shall present to the Owner an invoice equal to the percentage of the total amount of the Contract which has been completed from the start of the job up to the end of the preceding month plus the cost of materials suitably stored at the site thereof, together with such supporting evidence as may be required by the Owner. Subject to verification and approval of such invoice by the Owner, payment shall be due from the Owner on the thirtieth (30^{th}) day after the Owner's receipt of an invoice from the Contractor. The amount due from the Owner to the Contractor shall be ninety percent (90 %) of the amount thereof, less the aggregate of previous payments; and upon completion of the entire work, a sum sufficient to increase the total payments to one hundred percent (100 %) of the Contract price. In the event at any time prior payments by the Owner equal such percentage of the Contract price, further payments shall be made until final payment is due.

Project work that is not field work (e.g. submittals) may begin prior to March 26, 2001, however, the Contractor will not submit the first pay request before April 1, 2001. Contract submittals must be made in accordance with timelines required by these contract documents. Reimbursement for materials stored on the project site prior to April 1, 2001, if applicable, will be included on the first pay request. Payments or reimbursements will not be made prior to April 1, 2001.

PART 5 - SUBSTANTIAL COMPLETION

"Substantial Completion" is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with all Contract Documents so the Owner can occupy or utilize the Work for its intended use. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items which remain to be completed or corrected relating to that portion of the completed Work. This list shall be identified by the Contractor as the the "Contractor's Draft Punch List." Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract. Upon receipt of the Contractor's Draft Punch List, the Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's inspection discloses any item, whether or not included on the Contractor's Draft Punch List, which in the Owner's opinion prevents the Work from being substantially complete, the Contractor shall complete or correct such item upon receipt of notification by the Owner. The Contractor shall then submit a written request for another inspection from the Owner to determine Substantial Completion. When the Owner determines that the Work or designated portion thereof is substantially complete, the Owner will prepare and provide to the Contractor a Certificate of Substantial Completion which shall establish the date of Substantial Completion, and shall fix the time (if a change is required in the date originally established for final completion) within which the Contractor shall finish any remaining items of Work itemized by the Owner. This listing of remaining items of Work shall be

identified as the "Owner's Final Punch List" and shall be provided to the Contractor along with the Certificate of Substantial Completion.

PART 6 - ACCEPTANCE AND FINAL PAYMENT

A. Upon receipt of written notice from the Contractor that the work is ready for final inspection and acceptance, the Owner shall promptly make such inspection, and if and when it finds the work acceptable under the Contract and the Contract fully performed it shall promptly issue a final certificate stating that the work provided for in this Contract has been completed. The entire balance shall be paid to the Contractor by the Owner within thirty (30) days after the date of said final certificate.

B. Before issuance of the final certificate, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work has been paid, and that the work is free of all liens and encumbrances. In the case of disputed indebtedness or liens the Contractor may submit, in lieu of evidence of payment, a surety bond satisfactory to the Owner, guaranteeing payment of all such disputed accounts when adjudicated.

PART 7 - INSURANCE CERTIFICATE

Contractor shall deliver to Owner along with the signed Contract and prior to any equipment or personnel being brought onto Owner's premises in accordance with the terms of this Contract, a Certificate of Insurance evidencing the insurance coverages described in Part 28 of the General Provisions attached hereto and made part of this Contract.

PART 8 - COMPLIANCE WITH LAWS AND ORDINANCES

The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations, bearing on the conduct of the work as drawn and specified. If the Contractor performs any work contrary to any such law, ordinance, rule or regulation, he shall bear all costs arising therefrom. In particular, but without limiting the scope of the foregoing, the Contractor shall, and shall cause any Subcontractor to, comply with the terms and provisions of the Occupational Safety and Health Act of 1970, and all applicable rules, regulations, orders and occupational health and safety standards promulgated under and issued pursuant to such Acts in the discharge of its duties and obligations hereunder.

PART 9 - EMPLOYMENT AND RELATED LAWS

To the extent the goods and services to be provided hereunder are being utilized by the Contractor to fulfill obligations pursuant to a contract with the federal government or any agency thereof or to the extent otherwise applicable as a matter of law to the contracting and/or subcontracting of services or Work hereunder, the following provisions are incorporated by reference and the Contractor represents that it will comply with them: The

Equal Employment Opportunity Act, E.O. 11246 and 41 CFR Secs. 60-1.4 and 60-1.7; the Employment of Veterans Act, 41 CFR Sec. 60-250; and the Employment of Handicapped Act, 41 CFR Sec. 741-4, Drug Free Workplace Act of 1988 (Pub.L. 100-690); Walsh-Healey Public Contracts Act, 41 U.S.C. § 35-45; Service Contract Act of 1965, as amended, 41 U.S.C. 351, et seq.; Americans with Disabilities Act of 1990, 42 U.S.C. § 12101, et seq., such other laws or regulations as the federal government may require the Owner to flow down to its contractors; and all rules and regulations issued pursuant to the foregoing.

PART 10 - APPLICABLE LAW

The Contract shall be construed and enforced in accordance with the laws of the state where the work hereunder is to be performed.

PART 11 - ENTIRETY CLAUSE

This Contract constitutes the entire Agreement between the parties, and except as may be specifically set forth herein no changes can be made herein except by an Agreement in writing duly executed by the parties or their duly authorized agents.

IN WITNESS WHEREOF, the parties have executed this Contract the day and year first above written.

Contractor
By

Title

ASARCO Incorporated
Owner

By

Title

END OF SECTION

SECTION IX

NOTICE TO PROCEED

SECTION IX

NOTICE TO PROCEED

TO:

DATE:

PROJECT: Asarco East Helena Plant CAMU (RCRA Landfill) - Phase 1 Cell Construction Project

You are hereby notified to commence work in accordance with the Agreement dated _____ _____, 2000, and the conditions and provisions in the Contract Documents. The Contract time will commence to run _____, 200__.

The date of final completion of all work is November 1, 2001.

OWNER

ASARCO Incorporated

By: _____
John Shaw

Plant Manager, East Helena Plant
(Title)

ACKNOWLEDGMENT OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by Contractor.

By: _____

_____
(Title)

END OF SECTION

SECTION X

GENERAL PROVISIONS OF THE CONTRACT

SECTION X

GENERAL PROVISIONS OF THE CONTRACT

PART 1 - NOTICE

Written notice shall be deemed to have been duly served if delivered by hand or sent by certified or registered mail, in each case to the address or addresses of each party set forth on the first page of this Contract or at such other address subsequently designated by either party.

PART 2 - INTENT OF CONTRACT DOCUMENT

In case of conflict between Project Drawings and the Specifications. The Specifications shall govern Special Provisions supercede the Specification. The intention of this Contract is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Work not specifically shown on the Drawings or enumerated herein but that is reasonably necessary for the proper completion of the project shall be provided by the Contractor the same as if shown on the Drawings or enumerated herein. Materials or work described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized standards.

PART 3 - DRAWINGS AND SPECIFICATIONS

The Owner agrees to furnish without charge to the Contractor, one (l) set of reproducible Specifications and prints of all Drawings listed in the Specifications. Where revised or additional Drawings and Specifications are prepared as hereinafter provided the Owner will furnish one (1) set of reproducibiles of same to the Contractor.

The Owner agrees to furnish supplemental Drawings as may be required to clarify the Contract Drawings. Supplemental Drawings shall not enlarge nor decrease the scope of the work. Where alterations in the Contract Drawings and Specifications affect the extent of the work, the changes shall be governed as provided in Part 18 of these General Provisions.

The Contractor agrees to furnish to the Owner for approval three (3) sets of prints of the following Drawings at least 18 days before proceeding with the work covered therein:

A. All of the Contractor's Drawings which are made for this job.

B. Any shop drawings, detail sheets or erection diagrams required for any phase of the work.

C. Certified dimension sheets, wiring diagrams and performance curves covering any equipment purchased by the Contractor for the job.

The Contractor shall make any corrections required by the Owner in Drawings submitted for his approval. The Owner's approval as to design of such Drawings shall not relieve the Contractor of responsibility for errors or discrepancies of any sort.

The Contractor also agrees to furnish to the Owner five (5) sets of operation and installation instructions and equipment parts lists for all equipment furnished by the Contractor, not later than the date the equipment is shipped, including two (2) certified copies of dimension sheets, wiring diagrams and performance curves of same.

As soon as the Drawings referred to in subparagraphs A and B above are completed, checked and approved, the Contractor shall furnish three (3) complete final sets of prints to the Owner. The Contractor shall furnish three (3) complete final sets of As-Built Drawings within 30 days after final inspection.

PART 4 - ORDER OF COMPLETION; SCHEDULES

The Contractor shall complete any portion or portions of the work in such order of precedence as the Owner shall require, and the time of completion of the various portions or divisions of the work will be determined by the schedules mutually agreed upon by the Owner and the Contractor. Within fifteen (15) days of contract award, the Contractor will submit a detailed work plan and construction schedule that details the time and activities involved to complete major contract items for the duration of the contract. The schedule will include a chronological bar chart, activity descriptions and duration. The schedule will be updated monthly.

PART 5 - CONTRACTOR'S UNDERSTANDING

The Contractor shall satisfy itself as to the nature and location of the work, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this Contract. The Owner's subsurface investigations if any were made for design purposes only. Owner does not warrant that the conditions indicated by these investigations are representative of those throughout the work area, or in any portion of it. Information regarding subsurface conditions is provided for guidance only. Contractor shall promptly notify the Owner, in writing, of any condition which materially changes the work performed or to be performed under this Contract.

PART 6 - MATERIALS, APPLIANCES AND TEMPORARY FACILITIES

The Owner will not supply potable water, light, power, steam, compressed air or other utilities required for construction purposes unless specifically so provided in the Contract. The Owner will supply nonpotable water for compaction and dust suppression at fill station standpipes on the plant. The Contractor will be required to transport water to the point of use. Where such items are not supplied by the Owner they shall be furnished by the Contractor, and the Contractor shall, in either case, be required to make the necessary connections, provide

approved shut-off and safety devices and furnish and install all temporary lines required to bring them to the point of use.

Unless otherwise specified, all materials incorporated in the permanent work shall be new and both workmanship and materials shall be of the best quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall construct and maintain all necessary temporary facilities for the completion of the work. Upon completion of the work all such facilities shall, unless the Owner shall otherwise direct, be removed from the premises in accordance with written policies and procedures for environmental quality and will leave the work area clean.

PART 7 - EMPLOYEES OF CONTRACTOR

It is understood and agreed that the status of the Contractor hereunder is that of an independent Contractor. If for any reason however the Contractor's or any Subcontractor's employees or agents acquire a status imposing liability on the Owner for employer's contributions or taxes under the Federal Insurance Contributions Act, the Federal Unemployment Tax Act, any State Unemployment Tax or Wage Protection Act, or any other Act, the Contractor shall be exclusively liable for, and shall indemnify the Owner against, the same and agrees to comply with all such laws and regulations so as to relieve the Owner from any and all liability therefore and from the responsibility of making reports or keeping records with respect thereto.

The Contractor shall at all times enforce strict discipline and good order among his employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned to him.

Adequate sanitary facilities shall be provided and maintained by the Contractor.

PART 8 - ENVIRONMENTAL SAFETY AND HEALTH POLICY & TRAINING

By accepting this Contract and beginning performance hereunder, the Contractor acknowledges that providing a safe and healthy workplace and protecting the environment is the Contractor's first priority. The Contractor further agrees that any of its officers, agents, employees or subcontractors that enter the Owner's premises will be trained by the Contractor in the following areas: (a) applicable safety and health protection procedures, laws and regulations of federal, state and local governmental agencies, including but not limited to, OSHA and MSHA and/or their state or local equivalents; (b) applicable environmental protection laws, procedures and regulations enforced by federal, state and local governmental agencies including, but not limited to, the U.S. EPA and/or their state or local equivalents; and (c) the Owner's site policies, rules and procedures.

PART 9 - GENERAL SAFETY AND HEALTH PROVISIONS

a. The Contractor agrees to fully comply with all Owner control procedures relating to facility access, including but not limited to, employee identification and information requirements, sign in/out and Work initiation/termination notification procedures. The Contractor agrees to comply with all Owner requirements applicable to the Contractor employee presence on site, including but not limited to, the use of respirators and personal protection equipment (e.g., hard hats, seat belts, gloves, safety glasses and coveralls) and the general safety and health provisions set forth below. The Contractor and its subcontractors and employees will complete and provide to the Owner the forms contained within Owner's Contractor Policy, and any other requested forms relating to safety, health and environmental protection.

b. The Contractor shall designate a job site representative to be its safety supervisor and that person shall be responsible for promoting safety, health, and accident prevention, interest in compliance with applicable laws, rules and regulations among its employees, and coordinating such activities with the Owner and any subcontractors and suppliers of the Contractor.

c. The Contractor shall convey in writing and orally to its employees that they must notify the Owner immediately of any safety or health concerns, newly discovered hazards or problems they may have at the Project, regardless of whether such concerns or problems relate to any job site policy, law, rule, regulation or any physical condition or process involving the Project premises or any circumstances, or any actions or inactions of the Owner or the Contractor. Upon receipt of such notice from an employee, or as follow-up to any oral or written notice issued by the Owner to the Contractor's site personnel, the Contractor must notify the Owner in writing within twenty-four (24) hours, of the stated concern, hazard or problem and what corrective and/or protective action has been taken and/or remains to be taken to evaluate the problem, mitigate the problem, prevent its recurrence, and effectively communicate with affected employees.

d. The Contractor acknowledges and agrees that it has been provided with and reviewed the Owner's Contractor Policy, safety and health rules and training materials and agrees to institute and follow such rules and apply them to the Work performed under this Contract.

e. The Contractor shall take all reasonable precautions to ensure the safety and health of all persons working at the Project and all persons who may in any way be affected by the Work, including but not limited to:

   1. The Contractor agrees to limit its travel on the Owner's premises and facilities solely to that necessary for performing the contracted Work or services, and to

acccompanied by the Owner's personnel, unless authorized in writing to be unaccompanied following initial Work site arrival.

2 The Contractor agrees to comply with the Owner's substance abuse policies.

3. The Contractor agrees to become familiar with and train its employees in the physical characteristics of the worksite, including, but not limited to, any hazards, restricted areas, protective measures and applicable emergency and evacuation procedures.

4. The Contractor agrees to provide safe, functional equipment and materials and any training, testing or certifications that are necessary, appropriate or required to utilize such materials and equipment, including all equipment and tools needed to perform the job, and to provide approved personal protective equipment and clothing and respirators appropriate for the type of Work and Work location. The Contractor also agrees to maintain such equipment, materials and tools in good working condition.

5. The Contractor agrees to be subject, at any time, to the Owner's Contract compliance monitoring, including inspections, testing, and the Owner's acceptance or rejection of Contractor-provided equipment, materials and tools employed or used to complete the Work.

6. The Contractor agrees to obtain the Owner's written approval of its subcontractors and their employees before utilization on the Owner's premises. The Contractor must ensure that subcontractors meet the same safety and health requirements and provide the same information to the subcontractor as the Owner requires of the Contractor. The Contractor in turn must provide copies of all such information to the Owner.

f. The Contractor shall take all reasonable precautions to assure that it discovers, is made aware of and corrects any unsafe or unhealthy conditions, circumstances, actions or inactions that arise at the Project and that directly or indirectly affect any of the Contractor's personnel or the personnel of any other Contractor or the Owner at the site.

g. The Contractor shall promptly advise the Owner of any investigation or inspection of the Project site or the Contractor's workplace by any federal, state or local governmental agency and shall permit the Owner to participate fully in such inspections, and shall provide copies of inspection reports and notices of violations, and advise the Owner in writing of the progress and outcome of any such inspection or investigation or related litigation.

h. The Contractor shall immediately notify the Owner (and if requested provide a detailed written report) of every accident involving injury to personnel or

occupational illnesses or damages to the Owner's property occurring in connection with the Work or on the Owner's facility, and agrees to assist the Owner with any accident investigation in which the Contractor has any involvement by providing access to and preserving the Work area and by producing any and all related documents and records and any employees who have knowledge of, were involved in, or may have witnessed the accident for interviews. The Contractor also agrees to record and report all required information to all appropriate federal, state and local regulatory agencies and to provide copies of such reports and information to the Owner. The Contractor shall also report to the Owner employee days and hours worked while on company premises.

i. The Contractor acknowledges and agrees that any safety or health advice or training, inspections, safety or health equipment, health or biological monitoring or other safety or health services that may be provided or performed by the Owner for itself or the Contractor, its subcontractors or their employees is strictly voluntary and is provided solely to enhance safety and health in the workplace. Any such actions by the Owner shall not be alleged to change or diminish or relieve the Contractor or its subcontractors of contractual, legal or governmental responsibilities in these areas and shall not constitute, nor be alleged in any inspection, investigation or legal proceeding to constitute control, supervision or direction by the Owner of the Contractor's or its Contractor's employees.

j. The Contractor agrees to provide the Owner with its written safety program and certify that all required training has been completed in a timely manner pursuant to the applicable federal and state laws and regulations, and provide such completed forms as requested by the Owner to demonstrate compliance with this provision.

k. The Contractor agrees to use and employ a safety and health program at least as comprehensive as that included in Owner's Contractor Policy and to conform to all requirements and information requests set forth in said policy.

PART 10 - GENERAL ENVIRONMENTAL PROVISIONS

a. The Contractor is responsible for proper management, storage, removal and disposal of all supplies and materials utilized in the Work and waste materials generated in the course of performance of the Contract pursuant to the Owner's rules, and all applicable laws, ordinances, rules, regulations, standards and/or other governmental requirements related thereto, including but not limited to, those of OSHA, MSHA, the U.S. EPA, the Department of Transportation and all federal, state, municipal and local governmental agencies, and the applicable fire codes, including but not limited to, appropriate containers, labels, warnings and placards, and secondary containment for materials containing hazardous substances or petroleum.

b. The Contractor may store supplies, materials and wastes only in areas designated by the Owner. The Contractor may not store any wastes on the Owner's property in excess of ninety (90) days. If the Contractor utilizes any materials designated by federal, state or local law as a hazardous substance or hazardous waste, such materials must be stored in appropriate containers and spill control equipment must be available in the storage areas.

c. In the event of a fire or a spill or release of hazardous materials or wastes on the Owner's property, the Contractor will take actions necessary to prevent harm to the environment and human health, and immediately notify the Owner in accordance with the notice provision contained in Part 1, NOTICE, as well as the appropriate governmental authorities.

d. The Contractor is responsible for all costs associated with removal and off-site disposal of all hazardous and non-hazardous wastes. The Contractor must inform the Owner in accordance with the notice provision contained in Part 1, NOTICE at least ten (10) days before any waste material is transported off-site for recycling or disposal.

e. In the event that the Contractor leaves any materials, supplies or wastes on the Owner's property (except those placed in a designated on-site land disposal unit with the Owner's written permission) after completion of the Work, said materials, supplies or wastes will be disposed of by the Owner at the Contractor's expense.

f. Prior to commencement of the Work, the Contractor will provide the Owner with a Material Safety Data Sheet for all materials and supplies to be utilized on the Owner's property in the course of performance of the Contract. At the Owner's discretion, the Owner may require that the Contractor utilize a substitute product that is less hazardous.

g. The Contractor is responsible for making all such Material Safety Data Sheets available to its own employees and those of its subcontractors pursuant to the Occupational Safety and Health Act.

h. Unless the Owner provides prior written approval to the Contractor, the Contractor may not bring any materials onto the Owner's property nor utilize any products that contain the following substances: asbestos, chlorofluorocarbons (CFCs), chlorinated solvents, or polychlorinated biphenyls (PCBs).

PART 11 - ASSESSMENT FOR CONTRACTOR VIOLATIONS AND AUDIT OF CONTRACTOR COMPLIANCE

The Contractor recognizes and acknowledges that violations by the Contractor of health, safety, environmental and other statutory and regulatory authority may result in civil and/or criminal fines and penalties or in other damages and losses to both the Owner and the

Contractor. The Contractor agrees that the Owner shall have the right to assess or backcharge the Contractor in an amount equal to that which OSHA, MSHA or U.S. EPA is authorized to assess for health and safety or environmental violations where the Owner reasonably determines that the Contractor, its agents, subcontractors or employees have committed such a violation. The Owner also shall have the right to inspect or audit the Contractor's records, conduct or actions during the performance of this Contract for the purpose of monitoring the Contractor's compliance with and enforcement of the terms of Parts 8 through 11. The Owner's remedies against the Contractor for violation of the terms of this part shall not be limited to those set forth herein.

PART 12 - PATENTS

The Contractor shall indemnify and save harmless the Owner against and from any and all claims, losses, costs, damages, expenses, actions or other proceedings, growing out of or resulting from the infringement of any patent by the Contractor or any Subcontractor in the performance of this Contract, except that this provision shall not apply to patented articles or processes specified in Drawings or Specifications furnished by the Owner providing any such claim is not attributable to Contractor's negligence in the use of such patented articles or processes. This indemnity shall survive termination of the Contract.

PART 13 - SURVEYS, PERMITS AND REGULATIONS

If involved in the subject matter of this Contract, the base lines and mean datum will be established by the Owner; the control lines and levels and all general layout work will be the responsibility of the Contractor. All controls established by the Contractor shall be preserved and maintained throughout the life of the Contract.

The Contractor shall furnish all land surveys required. Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor. Permits, licenses and easements for any permanent structures or any permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Drawings and Specifications are at variance therewith, Contractor shall promptly notify the Owner in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work contrary to any such law, ordinance, rule or regulation, and without such notice to the Owner, Contractor shall bear all costs arising therefrom.

PART 14 - PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY

The Contractor shall provide and maintain all necessary watchmen, barricades, red lights and warning signs and take all necessary precautions for the protection and safety of employees on the work, of all other persons and of adjacent private and public property. The Contractor at all

times shall maintain adequate protection of the work from loss and damage and shall protect the Owner's property and all persons thereon from injury, damage or loss by reason of any act or omission of Contractor or any Subcontractor.

In an emergency affecting the safety of life or of the work or of adjoining property, the Contractor is, without special instructions or authorization from the Owner, hereby authorized to act at Contractor's discretion to prevent such threatened loss or injury. Contractor shall also so act if so instructed by the Owner.

Any compensation claimed by the Contractor on account of emergency work of this nature shall be determined by mutual agreement and failing which, by arbitration.

PART 15 - INSPECTION OF WORK

The Owner and its representatives shall at all times have access to the work and the Contractor shall provide safe and proper facilities for such access and for inspection.

If the Specifications, the Owner's instructions, laws, ordinances, or any public authority require any item of material, equipment or work to be specially tested or approved, the Contractor shall give the Owner timely notice in writing of its readiness for inspection, and if the inspection is by another authority than the Owner, of the date fixed for such inspection. Inspections by the Owner shall be promptly made, and where practicable at the source of supply.

If any work should be covered up before examination by Owner without approval or consent of the Owner, it must, if required by the Owner, be uncovered for examination and properly covered again at the Contractor's expense. Even though the Owner has examined a particular item of work, the Owner may order reexamination of such work, and if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract, the Owner shall pay the cost of reexamination and replacement. If such work is not in accordance with the Contract, the Contractor shall pay such cost.

PART 16 - SUPERVISION AND SUPERINTENDENCE

The Contractor shall maintain a competent staff at all times to supervise the work.

The Contractor shall keep on the work, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Owner. The superintendent's name will be provided in writing. Directions by the Owner may be given to the superintendent and shall be binding on the Contractor. Directions shall be confirmed in writing upon the written request of the Contractor. The superintendent shall carry a cellular phone.

The Contractor shall use its best judgment and skill in dealing with labor matters, and take all reasonable steps to avoid labor disputes. In the event of any strike or threat of strike, slowdown, featherbedding, or other like practices, the Contractor shall apprise the Owner of all relevant facts and implications of the particular labor problem involved, and shall consult in good faith

with the Owner in an endeavor to reach a mutually satisfactory solution to such labor problem and, so far as reasonably possible, to protect the Owner against delays affecting the work or damage or losses to its other operations.

PART 17 - QUALIFICATION AND PERFORMANCE OF CONTRACTOR'S EMPLOYEES

The Contractor shall at all times supply a sufficient number of skilled workmen to diligently pursue the work. All workmanship and materials shall be the best in its class and shall conform to all codes, rules, regulations and ordinances applying thereto. Where required by such codes, rules, regulations and ordinances, all workmen engaged in such work shall present evidence by certificate or otherwise that they are qualified to do the work in conformity with such codes, rules, regulations and ordinances. If any conflict occurs between the above mentioned codes, rules, etc., and the Specifications or the Drawings, the code requirements shall govern.

PART 18 - CHANGES IN THE WORK

The Owner, without invalidating this Contract, may at any time order extra work or make changes by altering, adding to or deducting from the work. If such extra work or changes involve a change in cost or in the time required for completion, the Contract price shall be increased or decreased by the fair value thereof and the time for completion shall be increased or decreased by the reasonable time allocable thereto. The Owner will itemize the changes to be made and upon receipt of written notice of same the Contractor agrees to submit promptly to Owner, in triplicate, an itemized statement of the extension or reduction in the time for completion of this Contract which the Contractor deems such reasonable time, and his calculation of the adjustment in the Contract price, resulting from the changes or extra work. This must be done before work on the changes is begun unless the Owner gives written order to proceed immediately.

In case the parties shall be unable to agree upon the increase or decrease, in the time for completion or in the Contract price, resulting from such extra work or changes, the Contractor shall nevertheless proceed with the work, including such extra work or changes, and the dispute shall be settled by arbitration.

No extra work or change shall be made except by written order of the Owner, and no claim for an addition to the Contract price or increase in the time for completion shall be valid unless the additional work was so ordered.

If the Contractor, in the course of the work, finds any discrepancy between the plans and the physical conditions encountered or any errors or omission in plans or in the layout as given by survey points and instructions, the Contractor shall immediately inform the Owner, in writing. After such discovery, no work shall be done by the Contractor involving such discrepancy, error or omission until authorized by the Owner; otherwise it will be done at the Contractor's risk. If the correction of such discrepancies, errors or omissions involves an increase or decrease in

costs or time of completion, the Contract price or time of completion shall be adjusted accordingly in the manner provided above as in the case of a change in the work.

PART 19 - WARRANTY AND QUALITY

The Contractor warrants that all goods, materials and services shall: conform to the specifications, drawings, samples or other description agreed to by the Contractor and the Owner; meet the highest industry standards for merchantability and workmanship; be free from all defects; and comply with all applicable laws and regulations. All goods and materials incorporated into the permanent Work shall be new. Such warranties shall survive the Owner's inspections, tests and acceptance for a period of twelve (12) months from the date the Owner issues a Certificate of Final Completion covering the Work. The Contractor's obligations and the Owner's rights hereunder shall remain in full force and effect beyond the twelve (12) month period to cover any defects that are latent or could not have been discovered through reasonable use of the goods or the services provided. If any goods or services performed are defective or otherwise not in conformity with the requirements of this Contract, the Owner, in addition to its other rights including the right to recover direct, consequential or incidental damages, attorney's fees and costs, may reject the same for full credit or require proper correction, replacement or completion thereof at the Contractor's expense. All rejected goods may either be returned to the Contractor at the Contractor's expense, or may be held by the Owner for disposition at the Contractor's risk and expense. The Contractor shall at all reasonable times permit inspection and testing by the Owner of all items, work in process, materials and workmanship covered by this Contract. The Contractor's warranty obligations shall survive termination.

PART 20 - DEDUCTION FOR UNCORRECTED WORK

If the Owner deems it inexpedient to correct work that has been damaged through the fault or neglect of the Contractor, or that was not done in accordance with the Contract, an amount to compensate the Owner fully for such damage or non-compliance shall be deducted from the Contract price. If the parties cannot agree on the amount of such deduction, it shall be determined by arbitration.

PART 21 - CORRECTION OF WORK BEFORE FINAL PAYMENT

At any and all times before final payment, Contractor shall promptly remove from the premises all materials, whether incorporated in the work or not, and take down all portions of the work, condemned by the Owner as failing to meet Contract requirements. The Contractor shall promptly replace and re-execute the Contractor's own work in accordance with this Contract and without expense to the Owner and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within ten (10) days after service of written notice, the Owner may remove them and may store the material at the expense of the Contractor. If the Contractor does not pay the expense of such removal within

ten (10) days time thereafter, the Owner may, upon ten (10) days written notice, sell such materials at auction or at private sale and shall pay to the Contractor the net proceeds thereof, after deducting all the cost and expense that should have been borne by the Contractor. Should such cost and expense exceed the auction or sale price, the Contractor shall pay such difference promptly to Owner upon presentation of substantiating invoice. The Contractor waives all rights to claim damages for sale of materials at auction or private sale. Any dispute under this Article shall be determined by arbitration.

PART 22 - CORRECTION OF WORK AFTER FINAL PAYMENT

Neither the final certificate nor final payment nor any provision in this Contract shall relieve the Contractor of liability for faulty materials or workmanship and the Contractor shall at its sole expense replace such materials and remedy such workmanship and any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within one (1) year from the date of completion. The Owner shall give notice of observed defects with reasonable promptness. Any dispute under this Article shall be determined by arbitration.

PART 23 - OWNER'S RIGHT TO TERMINATE CONTRACT

The Owner expects the Contractor to meet all obligations and conduct business in a professional manner. Failing that, the Owner reserves the right to terminate the Contract. The following could be reasons for termination:

- Bankruptcy or reorganization proceedings against the Contractor
- Failure to supply proper materials
- Failure to supply skilled workmen
- Failure to promptly pay subcontractors
- Failure to correct any other violation of the Contract after written notice by the Owner

Upon termination of the Contract, the Owner may take possession of the premises and all materials, tools and appliances thereon and finish the work by whatever method the Owner may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. When the work is finished, and the Owner has deducted any expenses and financial losses incurred by the Contractor's default, the unpaid balance shall be paid to the Contractor. If expenses and losses to the Owner exceed the unpaid balance, the Contractor shall pay the difference promptly to the Owner.

PART 24 - OWNER'S RIGHT TO TERMINATE CONTRACT WITHOUT CAUSE

Owner may at any time terminate Contractor's services under the Contract for any reason whatsoever by giving Contractor not less than fifteen (15) days written notice of termination setting forth the effective date of termination. In the event of such termination, Owner shall pay to Contractor (a) its reimbursable costs for services performed prior to the effective date of such termination, less payments previously paid by Owner on account thereof, (b) all other reimbursable costs and expenses which Contractor may incur as a result of such termination, including relocation of Contractor's field personnel and such other costs and expenses as may be approved by the Owner, and (c) an equitable portion of the profit based upon the actual work performed at the time of termination less any payment on account of profit which had been previously made. Except as may be otherwise expressly provided herein, Contractor shall not be entitled to demand any damages, compensation or indemnity of any kind as a consequence of such termination.

PART 25 - REMOVAL OF EQUIPMENT

In the case of termination of this Contract before completion from any cause whatever, the Contractor shall promptly remove any portion or all of Contractor's equipment and supplies from the property of the Owner, failing which the Owner shall have the right to remove such equipment and supplies at the expense and at the risk of the Contractor, without liability of the Owner for any damage to, or loss of the same.

PART 26 - USE OF COMPLETED PORTIONS

The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with this Contract. If such prior use increases the cost of or delays the work, the Contractor shall be entitled to extra compensation in reimbursement thereof, or extension of time equal to the delay or both, as the parties may agree upon, and failing agreement the dispute shall be determined by arbitration.

PART 27 - PAYMENTS WITHHELD

The Owner may withhold all or part of any progress or final payment to the extent necessary to protect the Owner from loss or damage on account of:

A. Damaged or defective work not remedied.

B. Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor or Owner.

C. Failure of the Contractor to make payments properly to Subcontractors or for material or labor.

D. A reasonable doubt that this Contract can be completed for the balance then unpaid or within the time specified.

E. Damage to the Owner's property or the work of another Contractor.

F. Failure of the Contractor to make satisfactory progress or to meet the established schedule or milestones.

PART 28 - CONTRACTOR'S INSURANCE

The Contractor shall, for the mutual protection and benefit of both the Owner and the Contractor, procure, pay for and maintain in full force and effect, at all times during the performance of the Work through the Owner's issuance of a Certificate of Final Acceptance of the Work, and for completed operations, policies of insurance issued by a responsible carrier or carriers acceptable to the Owner which afford the following coverages:

a. Workers' Compensation	Statutory
b. Employer's Liability	Not less than $500,000
c. Comprehensive General Liability including independent Contractors' Broad Form Contractual, Broad Form Property Damage, Personal Injury, Completed Operations and Products coverages (such Completed Operations and Products coverages shall be provided for a period of two (2) years after final completion of the Work and final acceptance by the Owner), and deletion of any exclusion pertaining to explosion, collapse, underground property damage, radiation and pollution hazards.	Not less than $2,000,000 combined single limit for both bodily injury and property damage.
d. Comprehensive Automobile Liability including Owned, Non-Owned, and Hired Car coverages.	Not less than $2,000,000 combined single limit for both bodily injury and property damage.

All policies, with the exception of Workers' Compensation, shall name the Owner, its subsidiaries, directors, officers, agents and employees as additional insureds, and shall expressly provide that the interest of same therein shall not be affected by any breach by the Contractor of any policy provision. All policies shall expressly provide that no less than thirty (30) days' prior written notice shall be given to the Owner in the event of material alteration to or cancellation of the coverages evidenced by such policies. Further, all policies shall contain endorsements waiving the insurer's right of subrogation against the Owner, its subsidiaries, agents and affiliated companies, and their directors, officers, agents and employees.

Upon renewal of each policy, the Contractor shall provide to the Owner a Certificate of Insurance evidencing all of the provisions specified in this Part.

The Contractor will maintain the original of all policies, endorsements and certificates, and provide the Owner with copies of same upon request of the Owner.

PART 29 - INDEMNITY BY CONTRACTOR

If the Contractor or any party under the Contractor's direction violates any law or causes any damage to person or property because of misconduct or negligence, then the Contractor hereby agrees to hold harmless the Owner, its affiliated companies and their directors and employees (hereafter collectively referred to as "Indemnities") for any fines or settlements of any character including attorney fees. This does not mean that the Contractor shall be required to indemnify the Indemnities against any loss caused by the sole negligence of one or more of the Indemnities. This indemnity shall survive termination of the Contract. The Contractor accepts all risk of injury or damage and all responsibility for any claims for damages whatsoever resulting from the use, misuse, or failure of any hoist, rigging, blocking, scaffolding, or other like or unlike equipment used by the Contractor or any Subcontractor, even though such equipment be furnished or loaned to the Contractor or any such Subcontractor by the Owner, and shall indemnify the Owner against all such claims.

PART 30 - OWNER'S RESPONSIBILITY FOR CERTAIN CASUALTIES

The Owner shall be responsible for all damage to the work, including all materials and equipment owned by the Owner on or about the premises intended for permanent use in the project or incidental to the construction thereof and included in the total cost of the work except when the same are proximately caused by any act, omission or negligence of the Contractor, its Subcontractor(s) or their agents, employees or representatives.

The Owner may during the process of the work, maintain and pay for property insurance to cover the work during construction with such deductible as it may at its sole discretion choose or Owner may at its sole option completely self-insure same.

If the Contractor desires any other insurance, beyond that provided by Owner, to protect Contractor's temporary structures, materials, hand tools, machinery and equipment he may obtain and pay for same.

PART 31 - DAMAGES TO OWNER'S PROPERTY

The Contractor shall be responsible, and reimburse the Owner, for any loss or expense to the Owner arising from damage to the work or other property of the Owner caused by the wrongful act or neglect of the Contractor, any Subcontractor or of the employees of the Contractor or any Subcontractor. Where such damage includes damage to the work it shall be repaired at the expense of the Contractor.

PART 32 - SURETY BONDS

If the Owner has so requested prior to the signing of this Contract, the Contractor shall furnish bond covering the faithful performance of this Contract and the payment of all obligations arising thereunder, in such form as the Owner may prescribe and with such sureties as it may approve. If such bond was required by instructions given previous to the receipt of Bids, the premium shall be paid by the Contractor; if subsequent thereto, it shall be paid by the Owner. If any change in work is authorized pursuant to the terms of this Contract, Contractor shall cooperate with Owner so as to ensure Owner's ability to secure and maintain the bonds for same.

PART 33 - LIENS

Neither the final payment nor any progress payment shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising on account of labor, materials, machinery or equipment in respect of which such payment is to be made, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as Contractor has knowledge or information the releases or receipts include all the labor and materials for which a lien could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

PART 34 - ASSIGNMENT

The Contractor shall not assign nor sublet this Contract in whole or in part, nor shall the Contractor assign any monies due or to become due it hereunder without the prior written consent of the Owner.

PART 35 - COORDINATION OF WORK

The Contractor shall conduct the work so as to cause a minimum of interference with the Owner's operations. Where interference with the Owner's operations becomes absolutely necessary, permission shall be requested by the Contractor not less than seventy-two (72) hours in advance.

When other Contractors or the Owner's forces are working on the job on the immediate premises, the Contractor agrees to so schedule the Contractor's work as not to make it necessary for the Contractor to cut into or otherwise alter any work that has been completed by such other persons. If the Contractor fails to do so, then the Contractor shall replace or repair the damaged work at Contractor's own expense and in a manner satisfactory to the Owner.

If any portion of the Contractor's work depends for proper execution or results upon the work of any other person, the Contractor shall inspect and promptly report to the Owner any defects in

such work that render it unsuitable for such proper execution and results. Contractor's failure to inspect and report shall constitute an acceptance of such other work as fit and proper for the reception of Contractor's work, except as to defects which may develop in such other work after the execution of Contractor's work.

PART 36 - SUBCONTRACTS

The Contractor shall, as soon as practicable after the execution of this Contract, notify the Owner in writing of the names of any Subcontractors proposed to be employed in any portion of the work and shall not employ any such Subcontractor without the prior approval of the Owner in writing and shall terminate the employment of any which the Owner may at any time object to as incompetent or unfit.

The Contractor agrees to require each Subcontractor to execute a Contract in writing binding such Subcontractor to the terms of this Contract insofar as applicable to his work, and requiring such Subcontractor, to the extent applicable, to assume toward the Contractor all the obligations and responsibilities that the Contractor assumes toward the Owner, unless specifically noted to the contrary in a written subcontract approved in writing by the Owner.

The Contractor shall be fully responsible to the Owner for the acts and omissions of all Subcontractors and of persons directly or indirectly employed by them. Nothing in this Contract shall create any contractual relationship between any Subcontractor and the Owner.

The word "Subcontractor", as employed herein, shall mean one having a direct contract with the Contractor, including one who furnished material worked to a special design according to the plans or Specifications of this work, but excluding one who merely furnished material not so worked.

PART 37 - ARBITRATION

If any controversy, claim, dispute or question shall arise between the parties in respect of the construction, meaning or effect of this Contract or anything contained in it, or the rights and liabilities of the parties hereunder or otherwise in relation to this Contract, then every such controversy, claim, dispute or question shall be decided by arbitration in accordance with the rules of the American Arbitration Association. This agreement so to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction. Notice of demand for arbitration will be filed in writing with the other party and with the American Arbitration Association. The demand for arbitration will be made within a reasonable time after the controversy, claim, dispute or question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such controversy, claim, dispute or question would be barred by the applicable statute of limitations. An award rendered pursuant to arbitration will be final and judgment may be entered in any court having jurisdiction thereof.

PART 38 - TITLE TO THE WORK

Title to all work completed or in the course of construction shall be in the Owner; and title to all machinery, equipment and materials to be incorporated in the work shall be in the Owner as soon as they are delivered on the site of the job.

PART 39 - TECHNICAL INFORMATION

The term "technical information" as used in this Agreement includes but is not limited to technical data, reports, models, Drawings, Specifications, operating manuals, designs, computations, formulas, apparatus, processes, patentable or unpatentable inventions and other engineering data. The Contractor agrees to accept Owner's decisions as to whether any particular information is technical information or is technical information which has been made or conceived under this Agreement.

It is understood that in the course of Contractor performance hereunder the Contractor may learn or have access to technical information of Owner. The Contractor agrees that the Contractor and its personnel will keep in confidence all such technical information of Owner and that the Contractor and its personnel will not use or disclose the same without Owner's written consent, either during the term of this Agreement or at any time thereafter.

The Contractor agrees to disclose to Owner all technical information made or conceived by the Contractor or its personnel in performance, or resulting from performance, under this Agreement. The Contractor agrees that all such technical information made or conceived by the Contractor or its personnel shall become and remain the free and unrestricted property of Owner and that the Contractor shall assign or cause the same to be assigned to Owner. The Contractor agrees that the Contractor and its personnel will keep in confidence all such technical information made or conceived by the Contractor or its personnel and that the Contractor and its personnel will not use or disclose the same without Owner's written consent, either during the term of this Agreement or any time thereafter.

The Contractor agrees, upon the request and at the expense of Owner, to make or cause personnel to make applications for Letters Patent in such countries as Owner may designate on those of the aforesaid inventions which Owner believes to be patentable; and to assign all such applications to Owner or its order; and to give Owner, its attorneys and solicitors all reasonable assistance in preparing such applications, and in prosecuting such applications in the patent office or offices involved and in defending and enforcing any patent that may be issued upon any such application; and to execute all papers that may be reasonably required in the prosecution of such applications or to vest in Owner or its assigns said inventions, applications and Letters Patent.

PART 40 - CLEANING UP

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by the Contractor's employees or the work, and at the completion of the work.

The Contractor will remove all Contractor's tools, scaffolding, surplus materials and rubbish from and about the site in accordance with the plant's written policies and procedures for environmental quality and shall leave the work area clean.

PART 41 - ADAPTABILITY OF PLANS AND SPECIFICATIONS

Except in the case of patented products for which there is no adequate substitute, the Contractor will not, without the prior written approval of the Owner, prepare any Drawings or Specifications nor do any engineering or planning for the prospective use or installation of any tool, piece of equipment, or material in the work which is of such a character that such Drawings, Specifications, engineering or planning could not be used with equal facility in connection with the product of all or most manufacturers of such tools, equipment or materials, or any substitute therefore.

PART 42 - ENGINEERING APPROVAL

The Contractor agrees to order no material or equipment and to do no actual construction, and to permit no work to be done by any Subcontractor or supplier of materials or equipment until the Drawings relating thereto, the lists and Specifications of materials, the equipment to be used and, the supplier have been approved by the Owner. During construction, the Contractor shall make no substitution of material without the prior written approval of the Owner. Provide Owner with a list and required material submittals for approval prior to ordering the material.

PART 43 - FORCE MAJEURE

Neither party shall be considered in default in the performance of its obligations hereunder to the extent that performance of such obligations is delayed, hindered, or prevented by force majeure. Force majeure shall be any cause beyond the control of the parties hereto which they cannot reasonably have foreseen and guarded against. Force majeure includes but is not limited to, acts of God, labor disputes, financial crisis, fires, riots, civil commotions or civil unrest, incendiarism, interference by civil or governmental authorities, and acts of war (declared or undeclared).

END OF SECTION

SECTION XI

SPECIAL PROVISIONS

SECTION XI

SPECIAL PROVISIONS

The Standard Specifications for Road and Bridge Construction, edition of 1995, prepared by the Montana Department of Transportation and Montana Transportation Commission, hereinafter referred to as the "Standard Specifications", shall govern this Project and form the basis of this Contract, except as modified in these Contract Documents. Contractor shall note the 1995 Standard Specifications shall be used as modified herein without subsequent amendments or newer publications made by the Montana Department of Transportation and Montana Transportation Commission. The Standard Specifications are modified herein as detailed in the following divisions. Division and subdivision numbers refer to corresponding numbers of the Standard Specifications. Additional division or sections numbers may be used to specify items of work not included in the Standard Specifications.

Copies of the 1995 Standard Specifications may be obtained from Montana Department of Transportation, Contract Plans Section, 2701 Prospect Avenue, P.O. Box 201001, Helena, Montana 59620-1001, Telephone (406) 444-6215.

DIVISION 100 - GENERAL PROVISIONS
DIVISION 200 - EARTHWORK
DIVISION 300 - AGGREGATE SURFACING AND BASE COURSES
DIVISION 400 - BITUMINOUS PAVEMENTS
DIVISION 500 - RIGID PAVEMENT
DIVISION 550 - STRUCTURES
DIVISION 600 - MISCELLANEOUS CONSTRUCTION
DIVISION 700 - MATERIALS

DIVISION 100

GENERAL PROVISIONS

SECTION 102 - BIDDING REQUIREMENTS AND CONDITIONS

Delete this section.

SECTION 103 - AWARD AND EXECUTION OF CONTRACT

Delete this section.

SECTION 104 - SCOPE OF WORK

Add the following subsections.

104.09.1 Scope of Work

The CAMU for the East Helena Plant will contain plant site soil, sediment and demolition debris. Portions of this Contract include tasks that involve hazardous and/or regulated waste. During the performance of these tasks, the Contractor is responsible for the compliance of all appropriate regulations and safety standards. The CAMU cell will be constructed to meet the Performance Standards stated in 40 CFR 264 subpart N - Landfills and EPA guidance ("Seminar Publication, Requirements for Hazardous Waste Landfill Design, Construction and Closure").

1. Construct a Resource Conservation and Recovery Act (RCRA) Landfill

The bottom half of the landfill, called the cell, includes primary and secondary underliner systems. The primary liner, 60-mil HDPE geomembrane, underlies the waste material, but is separated from the waste by a separation geotextile and a 250-mil geonet. The secondary liner system, a composite liner, underlies the primary liner and is separated from it by another 250-mil geonet layer. This composite liner consists of a 3-foot thick layer of compacted clay overlain by a 60-mil HDPE geomembrane. The compacted clay liner will be constructed from native soils excavated to construct the CAMU cell. The upper half of the landfill, called the cap, overlies the waste material and contains a composite liner consisting of 2 feet of compacted clay overlain by a 40-mil HDPE geomembrane. A 6-inch gas migration layer will be installed immediately below the compacted clay cover.

The configuration of the Phase 1 cell area includes 3:1 side slopes on the inside of the cell and 5:1 side slopes on the cap. It provides a potential storage volume in the cell of approximately 113,000 cubic yards. Additional capacity can be obtained by raising the height of the cell while maintaining the identical footprint. The footprint for the Phase 1 cell covers approximately 5 acres.

The bottom of the cell excavation is approximately 10 feet below ground surface and the finished CAMU cap is approximately 20 feet above the existing ground surface. The primary

and secondary liners will have leak collection and removal systems constructed using geonets in the CAMU cell. Collected leakage from the final CAMU will be removed through individual standpipes placed in each geonet layer. These pipes, which run up the side of the cell, will allow collection and withdrawal of leakage using a peristaltic pump without penetrating the cell liners.

The compacted clay liners will be constructed from soils excavated to construct the CAMU cell. Except for final preparation of the clay liners to receive the geomembranes, sheepsfoot rollers will accomplish compaction. A smooth drum roller will be used to provide a smooth top surface of the clay liner once it is ready to receive the flexible membrane liner. Maintain positive drainage at all times. The compacted clay liner and compacted clay cover will be compacted to 95 percent of Proctor maximum dry density, while the cover soil layer in the landfill cap will be compacted to 90 percent Proctor maximum dry density. The top 6 inches of the subgrade, below the compacted clay liner in the bottom of the cell, will also be compacted to 90 percent Proctor maximum dry density.

Native site soils are classified as fine-grained soils, but because of variations in plasticity, soils are classified as low plasticity silt (ML), as low plasticity clay (CL); and as low plasticity silty clay (CL-ML). The maximum proctor density of soils at the site was achieved at a moisture content of 20 percent and was measured to be approximately 123 to 126 pcf moist or 103 pcf dry.

2. Load, Transport, Place and Compact Source Soils and Construction Debris in Landfill

Approximately 113,000 cubic yards of waste material will be removed from the plant site and disposed in the Phase 1 cell. Wastes to be placed in the cell are primarily soils and construction debris containing elevated arsenic and metals concentrations. The primary chemical characteristic of the waste materials to be landfilled is elevated concentrations of lead. Only 40-hour-trained personnel may work on the site during the placement of waste and until the final completion of the installation of the HDPE cap (see Section 110). HAZWOPER training will not be required for Contractor workers prior to waste placement and after CAMU capping when completing tasks off of the plant.

Source soils and construction debris will be placed and compacted in the cell using methods that minimize voids, settlement, and damage to the liners. A layer of fine-grained Lower Lake sediments (2 feet thick), presently stockpiled on the plant adjacent to the CAMU site, will be the first source soils placed in the cell. These soils are fine grained and contain no oversized materials that could damage the liners. Source soils and demolition debris will be placed and compacted in the cell (using sheepsfoot rollers) in lifts not to exceed 2 feet thick across the bottom of the cell. Bulk concrete will be broken or otherwise reduced in size not to exceed 2 feet in diameter. Metals will be flattened and/or cut as necessary to minimize voids, settlement and damage to the liners. Long debris items (e.g. timbers, pipe or steel

beams) will be placed horizontally in the fill lifts and care will be taken to compact adjacent fill. If determined unsuitable for placement in the landfill, large metal debris (e.g. abandoned equipment) will be stockpiled at a designated plant area for subsequent management by the Owner. Plastic, ceramic and glass materials will be crushed in the compaction process to minimize voids. Special care will be taken near the sides of the cell to place source soil from the Lower Lake stockpile that will act as a cushion or operation layer to protect the liner systems against damage. A layer of fine-grained Lower Lake sediments (approximately 1.5 feet thick) will be placed above other waste materials in the cell to provide a protective cushion below the compacted clay cap.

A dust control program will be implemented to minimize the creation and spread of dust during the excavating, loading, hauling, placing and compacting activities. A fine mist of water will be utilized to minimize dust during loading activities. Haul trucks will be covered and will have gate seals. Solid bottom hauling vehicles will be used to minimize leakage potential. Haul routes will be swept continuously during hauling operations with a dry vacuum sweeper and watered, as needed, to minimize dust. Watering will be required during placing and compacting activities as needed for compaction and dust suppression.

The existing reinforced PVC cover over the Lower Lake stockpile will be salvaged by the Contractor after removal of the stockpiled waste material. The cover will be rolled and stored by the Contractor at a designated plant area.

3. Closure of Landfill

A cap drainage system consisting of a 1-foot thick layer of drain gravel constructed with minimum slope of 3 percent will be installed on the top of the 40 mil HDPE cap. The drain gravel will be overlain with a drainage geotextile. This layer drains to a corrugated drainpipe embedded in a gravel-filled trench at the toe of the landfill cap slope. The cap drain pipe outlets to a shallow detention pond adjacent to the landfill that provides drainage water disposal by infiltration and evaporation. A surface water drainage channel will be installed around the toe of the CAMU that will also drain to the runoff control pond.

The topsoil cover provides frost protection to the cap composite liner and, after seeding, protects the surface of the landfill from erosion. It consists of 8-inches of topsoil overlying 16-inches of subsoil (from CAMU excavations) installed above the cap drainage system. The project specifications require the organic rich topsoil to be salvaged and stockpiled separate from the underlying subsoil to ensure a proper medium for seeding with grasses. The CAMU cover has been designed with a top slope of 3 percent and fairly flat side slopes of 5:1 to resist erosion and minimize maintenance.

4. **Associated surface water and erosion controls, access road improvements, railroad crossing improvements, vegetation of newly constructed and disturbed areas, facility fencing, health and safety requirements, site access and haul controls (including traffic control) and construction surveys.**

SURFACE WATER AND EROSION CONTROLS

Temporary run-on diversion ditches will be constructed to prevent flow onto the construction site. Silt control fence will be installed around the perimeter of the site. During construction, the Contractor will be required to place a temporary cover over the cell when there is a significant probability of a rainfall event as determined by the Owner. The temporary cover will be used until the cell has been capped with a geomembrane. Runoff will not be allowed to contact waste materials in the cell. Runoff contacting disturbed areas or from the top of the cover over waste materials will be routed to the runoff control pond. Compacted clay liners and waste material must be kept as dry as possible to minimize potential landfill leachate.

Permanent run-on diversion ditches will be constructed that are capable of preventing flow onto the active portion of the landfill during peak discharge from a 24-hour, 25-year storm. The Phase 1 cell site lies within a drainage area of 8.57 acres with a peak run-on of 180 gpm to be diverted around the site.

The runoff management system will collect and control at least the water volume resulting from a 24-hour, 25-year storm. A 0.26 acre-feet runoff control pond will be constructed and maintained until vegetation is well established.

ACCESS ROAD IMPROVEMENTS

Access roads will be constructed across the borrow ditch on the south side of the county road south of the Plant. A 31-inch by 50-inch CMP area will be installed through the northern access road embankment and a 42-inch diameter CMP will be installed through the southern access road embankment. All haul routes will be paved and maintained throughout the project. The paved access road will be 30 feet wide and will consist of 4 inches of asphalt and 6 inches of crushed base course over a compacted subgrade or embankment. Access road embankment and installation of a chain link gate with associated fencing adjustments to the existing fence will be needed at the plant boundary for the northwestern access road.

RAILROAD CROSSING IMPROVEMENTS

Railroad crossing improvements will be required where the access roads cross-existing railroad tracks. Railroad crossing improvements are required at both access road crossings. Montana Rail Link (MRL) requires MRL crews to complete all project work within 4.5 feet of track centerline. The Contractor will include all costs associated with MRL work and associated MRL requirements (flagging, insurance and signs) in the bid price.

REVEGETION

The surface of the CAMU and all off-plant areas disturbed during construction will be revegetated. Disturbed areas uphill from the permanent diversion ditches will be reseeded

and mulched. The area between Upper and Lower Lake will not be revegetated. All other disturbed areas will have seed, fertilizer and mulch applied. Paved on-plant areas under removed piles will be swept clean. Disturbed areas between Upper and Lower Lakes will be graded and capped with soils excavated to construct the CAMU cell. Subgrade in that area will be compacted to a depth of 6 inches and a 12-inch layer of compacted clay cap will be constructed using soils from CAMU excavations.

FACILITY FENCING

The CAMU facility will be fenced with a 6-foot high chain link fence with 3-strand barbed wire top section. Gates (24 feet wide) will be provided at the access roads. Project signs will be installed on each of the four sides of the CAMU perimeter fence.

HEALTH AND SAFETY

The Contractor will prepare, submit and maintain an approvable written Site Health and Safety Plan. It is the Contractor's responsibility for implementing a safety program to protect workers from all health and safety hazards associated with this project. Site health and safety requirements are described in Section 110 of this document.

Health and Safety training requirements for Contractor workers are dependent upon the type of work being performed. There are three distinct types of trained workers needed to complete project work.

TYPE	REQUIRED HEALTH AND SAFETY TRAINING	WORK TASKS
GROUP A	None	General Work Force -- Off Plant
GROUP B	No 40 Hr OSHA	Topsoil Removal And Stockpile
	Blood Lead Tests	Topsoil Replacement
	No Physical	
	Respirator Fit Test	
	Site Specific Training	(Additional PPE = Respirator, Coveralls, Showers, Lunchroom)
GROUP C	40 Hr – HAZWOPER-OSHA	Load, Haul, Place And Compact Waste Materials And On-Plant Tasks
	Blood Lead Tests	
	Full Physical	
	Respirator Fit Test	
	Site Specific Training	(Additional PPE = Respirator, Coveralls, Showers, Lunchroom)
	Asbestos - 8 Hr Worker Awareness OSHA	

SITE ACCESS AND HAUL CONTROL

The Contractor will control public access to the CAMU site during construction. Temporary orange poly fence (safety fence) will be installed around the perimeter of the CAMU construction site to prevent access by the public and wildlife. Safety fence and silt control

fence will be mounted on the same fence posts. Temporary locking gates will be installed at site access points. The Contractor will provide all traffic control associated with hauling and other construction activities between the plant and the CAMU site. The Contractor will be responsible for site security until final acceptance of the work. A Contractor's field office will be maintained near the CAMU throughout the project. The Contractor's superintendent will carry a cellular phone.

SURVEYS

Surveys include layout, grade control, quantity determination and as-built surveys. The Contractor will complete all surveys and furnish all stakes, markers, tools and equipment required to lay out the work from bench marks and/or control point markers indicated by the Engineer. Copies of all survey notes will be given to the Engineer within 1 day after the survey is conducted. The Contractor will not disturb existing survey monuments or bench marks without the consent of the Engineer. A licensed land surveyor will replace markers that are accidentally disturbed by earthwork operations at the Contractor's expense. Existing groundwater monitoring wells and manhole lids will not be disturbed.

CONSTRUCTION PHOTOGRAPHS

At least monthly during construction of the work, the Contractor will provide project pictures. Furnish two sets of (approximately 3" x 5") and negatives to the Owner. Provide a minimum of twelve (12) photos per month, including photos of each bid item before, during and after construction. Photos must be taken of all items to be buried while they are still exposed.

CONTRACTOR STORAGE AREA

Prior to notice to proceed, Contractor will be provided a storage area near the project site. Contractor is responsible for the security of assigned storage area (5,000 S.F., more or less). All temporary facilities (including tractor trailers) will be maintained in good repair. Storage areas will be enclosed by 6' chain link fence with access gates. Spare keys to any locked gates will be provided to the Owner. Storage areas will be clean, orderly, and free of debris, demolished materials, etc.

QUALITY CONTROL

THE CONTRACTOR IS RESPONSIBLE FOR QUALITY CONTROL WHICH IS CONSIDERED TO BE A MAJOR INSPECTABLE ITEM OF THIS CONTRACT. The Contractor will perform all Quality Control inspection and/or testing required by this contract unless otherwise specified. The Quality Control system must consist of personnel, plans, procedures, and organization necessary to provide materials, equipment, workmanship, fabrication, construction and operations that comply with contract requirements. The system will cover construction operations, including fabrication both on-site and off-site, and will be keyed to the proposed construction sequence. The Notice to Proceed will not be issued until the Contractor submits an acceptable Quality Control Plan.

The Contractor's Quality Control Plan will identify the personnel, procedures, instructions, records, forms, and as a minimum, will include the following:

- A description of the Quality Control management organization including an organizational chart.
- The number, classifications, qualifications, duties, responsibilities, and authorities of personnel: A copy of a letter, signed by an authorized official of the firm, which describes the responsibilities and delegates the authorities of the Quality Control manager will be furnished. The Quality Control manager must have a minimum of five years of documented experience in the primary areas of construction included in this contract. Include qualifications in the submitted plan for Owner approval. This contract does not require a full time Quality Control Manager. The individual assigned may have other duties within the contractor's organization but must commit a minimum average of two hours per day towards fulfilling the QC requirements of this section. Hours dedicated to this function will be annotated on the submitted QC records.
- The Contractor's Quality Control activities to be performed, include those of subcontractors, off-site fabricators, and suppliers. A job specific detailed work item list for inspection purposes will be developed by the contractor. The list will be broken into sections identical to the contract specifications and will contain all inspection actions necessary to ensure full compliance with the contract.
- Quality Control testing procedures including corrective actions to be taken where non-compliance is noted by the Quality Control Manager.
- Documentation format for Contractor's Quality Control activities and testing. The provided form is to be used for documenting daily inspections, corrective actions, etc.
- Procedures for ensuring As-Builts are accurate and updated daily.
- Methods to ensure scheduled appointments are met and documentation to verify arrival and departure times at the work site.
- A listing of all required mechanical and electrical testing, balancing, and operational tests.
- Safety program issues will be addressed in the Site Health and Safety Plan.

The Quality Control Plan will be reviewed and approved, if acceptable, by the Engineer. The Contractor will make such changes and additions necessary for clarity and completeness as requested. Acceptance is conditional and the Owner reserves the right to require the Contractor to make changes in the Quality Control Plan, personnel, and operations to correct deficiencies found by the Engineer during performance of work. No change will be implemented prior to acceptance in writing by the Owner. The Contractor will submit four copies of the proposed Quality Control Plan for approval not more than 15 days after Contract Award.

The Quality Control Records will contain a record of daily inspections for all work accomplished. Specific items of work checked each day will be annotated. All work-in-place must be certified as complying with the contract plans and specifications. Non-compliance items must be clearly noted. Corrective actions must be outlined and detailed for non-compliance items. The Contractor will maintain daily records, which will be on-the-job site and available for review by the Engineer. Daily reports will be signed by the designated Quality Control Manager and will indicate hours spent on Quality Control that day. A copy of the QC daily reports will be given to the Engineer.

DAILY CONSTRUCTION REPORT

Date: _____

Project: _____ Project # _____

Client: _____ Project Manager: _____

Contractor: _____

Weather _____ Temperature _____

Wind _____ Precipitation _____

FIELD FORCE			
Name of Contractor	**Prime or Subcontractor**	**No. of Persons on Project**	**Remarks**

ENGINEER'S PERSONNEL			
Time	**Name**	**Duties**	**Remarks**

EQUIPMENT ON THE SITE

CONSTRUCTION ACTIVITIES

DAILY CONSTRUCTION REPORT (continued)

Page: _____

Date: _____

Initials: _____

ACTIVITIES

Items of Work Completed	Location	Amounts	Remarks

By:_____ **Title:**_____

ITEMS PROVIDED BY ASARCO

With the exception of the following items that will be provided by the Owner, the Contractor will supply all labor, tools, equipment, materials and incidentals necessary to construct the CAMU in accordance with project drawings and specifications, in compliance with all applicable OSHA regulations and in compliance with the Asarco East Helena Plant health and safety rules and regulations. The Contractor will be responsible for all costs related to Health and Safety except for items specifically listed below.

The following items will be provided by the Owner or Owner's representative:

1. Nonpotable water for dust control and compaction;
2. Initial survey monuments and bench marks;
3. Quality control tests and compaction tests. (Costs associated with retesting because of noncompliance will be the Contractor's responsibility.);
4. Air monitoring;
5. During the Waste Placement Phase and topsoil salvage and replacement tasks, the Owner will provide:

    a. Coveralls;
    b. Respirators;
    c. Respirator fit tests; and
    d. Site Specific Health and Safety training.

6. During Waste Placement Phase and topsoil salvage and replacement tasks, the Owner will launder coveralls and clean and maintain respirators daily; and
7. During the Waste Placement Phase and topsoil salvage and replacement tasks, the Owner will provide a change room, a shower facility and a lunchroom.

104.10 ORDER OF WORK

The Contractor shall furnish all materials, tools and labor necessary to perform the tasks in the order outlined below.

#	TASK	Required Health and Safety Training
1.	Contract award	NA
2.	Contract submittals	NA
3.	Material submittals	NA
4.	Order liner, geonet, pipe, other materials	NA
5.	Obtain construction permits	NA
6.	Mobilization and set-up field office and related facilities	Group A
7.	Site layout surveys	Group A
8.	Install site access controls (temporary fence and gates)	Group A
9.	Install storm water BMPs (temporary run-on diversion ditch, silt fence, etc.)	Group A

10.	Railroad crossing improvements (by MRL)	Group A
11.	Construct access roads, including culvert installations	Group A
12.	Strip and stockpile topsoil and subsoil (upper 8")	Group B
13.	Strip and stockpile subsoil (8" to 24")	Group A
14.	Excavate and stockpile soils from CAMU cell (below 24" depth)	Group A
15.	Grade, roll and compact liner subgrade	Group A
16.	Place and compact Compacted Clay Liner (CCL)	Group A
17.	Grade, roll and compact CCL surface for HDPE	Group A
18.	Install secondary containment HDPE	Group A
19.	Install secondary containment geonet	Group A
20.	Install secondary containment leachate removal system	Group A
21.	Install primary containment HDPE	Group A
22.	Install primary containment geonet and geotextile	Group A
23.	Install primary containment leachate removal system	Group A
24.	Crush or otherwise break oversized concrete debris into 2 ft or less dimensions	Group C
25.	Traffic control	Group C
26.	Dust control	Group C
27.	Haul road maintenance and continuous sweeping	Group C
28.	Load and haul waste soil and debris from plant (Lower Lake sediments first and last)	Group C
29.	Place and compact waste soils and debris in CAMU	Group C
30.	Salvage and stockpile designated items on the plant, including, but not limited to, concrete jersey barriers, Lower Lake sediment pile cover and large metal scrap items	Group C
31.	Install Gas Migration Layer and Venting System	Group C
32.	Implement and maintain surface water controls during Waste Placement Phase	Group C
33.	Sweep clean paved on-plant areas under removed waste piles	Group C
34.	Place and compact Compacted Clay Cover	Group C
35.	Grade and roll surface of Compacted Clay Cover	Group C
36.	Grade and compact subgrade for cap at former southeast stockpile area	Group C
37.	Spread, grade and compact clay cover at former southeast stockpile area	Group C
38.	Install cap HDPE on CAMU	Group A
39.	Install cap drain material and install drainage geotextile on cap drain material	Group A
40.	Place and compact lower cover soil layers (16" subsoil)	Group A
41.	Place and compact upper cover soil layer (8" topsoil)	Group B
42.	Construct permanent run-on diversion ditches, remove temporary run-on diversion ditches	Group A
43.	Prepare seedbed and mulch, seed, & fertilize cap of CAMU & other disturbed areas	Group A

44.	Install perimeter chain link fence, gates and signs	Group A
45.	Final Cleanup	Group A
46.	Final Contract Submittals	Group A

104.11 SUBMITTAL SCHEDULE

Required contract submittals are summarized in Table 104-1. Submittals required by the Contract Documents that may have been inadvertently omitted from Table 104-1 must still be submitted.

SETION 105 - CONTROL OF WORK

Delete this section

SECTION 106 - CONTROL OF MATERIALS

Delete this section.

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

Delete this section.

SECTION 108 - PROSECUTION AND PROGRESS

Delete this section.

SECTION 109 - MEASUREMENT AND PAYMENT

Add the following subsection to this section

109.11 BID ITEM DESCRIPTION

This section describes work items included in each bid item. All of the incidentals items required to complete the work may not be listed. The cost of all such incidentals shall be included in the various related bid items.

109.11.01 Mobilization

(a) Work Included. Perform work in accordance with Standard Specification Section 109.09.

(b) Measurement and Payment. Measurement and payment will be in accordance with Section 109.09.

109.11.02 Culvert, 31" by 50" CMP Arch

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 207 Culvert Excavation and Trench Excavation
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses

TABLE 104-1. SUBMITTAL SCHEDULE

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TABLE 104.1 SUBMITTAL SCHEDULE

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TABLE 104.1 SUBMITTAL SCHEDULE

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- Section 701 Aggregates
- Section 707 Joint Materials
- Section 709 Metal Pipe

(b) Work Included.
- Material submittals (pipe, bedding and shop drawings);
- Furnish and install CMPA as shown in the Drawings;
- Provide, place and compact pipe bedding and backfill;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Excavation of pipe trench, subgrade preparation, grading, compaction;
- Provide and apply water as needed for compaction and dust suppression;
- Conduct layout, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will be made on the pipeline along the top of the pipe or along a line parallel thereto.

(d) Payment. This item will be paid for at the Contract unit price bid for Culvert, 31" by 50" CMP Arch.

109.11.03 Culvert, 42" CMP

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 207 Culvert Excavation and Trench Excavation
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses
- Section 701 Aggregates
- Section 707 Joint Materials
- Section 709 Metal Pipe

(b) Work Included.
- Material submittals (pipe, bedding and shop drawings);
- Furnish and install CMP as shown in the Drawings;
- Provide, place and compact pipe bedding and backfill;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Excavation of pipe trench, subgrade preparation, grading, compaction;
- Provide and apply water as needed for compaction and dust suppression;
- Conduct layout, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will be made on the pipeline along the top of the pipe or along a line parallel thereto.

(d) Payment. This item will be paid for at the Contract unit price bid for Culvert, 42" diameter CMP.

109.11.04 Access Roads

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 203 Excavation and Embankment
- Section 301 Aggregate Surfacing
- Section 401 Plant Mix Pavement
- Section 607 Fences
- Section 613 Riprap and Slope and Bank Protection
- Section 701 Aggregates
- Section 702 Bituminous Materials
- Section 712 Fencing Materials

(b) Work Included.

- Obtain county road crossing permits and pay associated fees. Provide copy of permit to Engineer no later than 15 days prior to beginning construction of this item;
- Material submittals (aggregate, pavement mix design, riprap, fence and gate shop drawings);
- Provide and install gate in South Fence of Ore Storage Yard for access road use. Submit shop drawings for Owner approval. The chain link gate and adjacent support panels with three strands of top wire must match existing fence;
- Provide and install chainlink fence adjustments associated with gate installation;
- Provide and install gate at access route location in existing fence between Upper and Lower Lakes;
- Clearing and grubbing required for access road construction;
- Provide, submit for approval and revise, as needed, the detailed layout, design and contractor drawings for access routes at approximate locations shown on the Drawings;
- Provide borrow, place, grade and compact embankment to construct access roads as approved on Contractors Drawings;
- Provide, place and compact crushed base course;
- Provide, place and compact asphalt pavement (two 2-inch layers);
- Provide and apply water as needed for compaction and dust suppression;
- Provide and place riprap and bedding protection for access roads;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Subgrade preparation, grading, compaction;
- Haul road maintenance is included in a separate item;
- Culverts and associated bedding are included in a separate item;
- Conduct layout, quality control and as-built field surveys under a separate item; and

- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the lump sum price bid for Access Roads.

109.11.05 Railroad Crossing Improvements

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment
- Section 301 Aggregate Surfacing
- Section 701 Aggregates

(b) Work Included.
- Obtain railroad crossing permits and pay associated fees. Provide copy of permit to Engineer no later than 15 days prior to beginning construction of this item;
- Improvements to railroad tracks at both access road crossing locations as required by railroad company (MRL). MRL requires MRL crews to complete all work within 4.5 feet of track centerline. Remove existing timbers at southeast crossing. Install new crossings at both locations.
- This item includes reimbursement for all MRL costs to complete the work as well as MRL required insurance, flagging, signs and controls;
- Conduct layout, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the lump sum price bid for Railroad Crossing Improvements.

109.11.06 Temporary Erosion Controls

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment
- Section 208 Water Pollution Control and Stream Preservation
- Section 613 Riprap and Slope and Bank Protection
- Section 622 Geosynthetics Construction
- Section 707 Joint Materials
- Section 708 Concrete, Plastic, and Fiber Pipe
- Section 709 Metal Pipe
- Section 713 Miscellaneous Materials

(b) Work Included.
- Prepare a project Erosion Control Plan (ECP) that addresses erosion and sediment control at the excavation stage (includes impacted clay liner construction), the waste material placement stage and cap construction stage. Use project drawings as appropriate.

- Submit ECP to Owner for approval and revise per Owner's comments;
- Submit Owner-approved ECP to regulatory agency and obtain MPDES Construction storm water discharge permit;
- Pay of fees associated with obtaining MPDES Construction storm water discharge permit;
- Material submittals (silt fence, other);
- Install and maintain all necessary construction BMPs;
- Install Silt control fence around the perimeter of all disturbed areas; (runoff from disturbed areas must drain through a silt fence or runoff control pond, whichever is appropriate);
- Construct Runoff Control Pond (stockpile associated excavated topsoil and subsoils in accordance with specifications);
- Install temporary run-on diversion ditches;
- Prevent run-on from running into excavations or onto disturbed areas;
- Maintain positive drainage during all construction activities;
- Dewater excavations and site ponds as needed for construction in accordance with specifications;
- Provide and place a temporary cover over the cell when there is a significant probability of a rainfall event. The temporary cell cover will be used during the waste placement stage (until the cell has been capped with the HDPE liner);
- Remove all temporary controls when vegetation is established or otherwise determined appropriate; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Temporary Erosion Controls.

109.11.07 Excavation & Stockpile

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 201 Clearing and Grubbing
- Section 202 Removal of Structures and Obstructions
- Section 203 Excavation and Embankment
- Section 206 Haul

(b) Work Included.
- Clearing and grubbing;
- Excavate, load, haul and place organic topsoil (to a depth of approximately 8-inches) and subsoil (to a depth of approximately 24-inches below ground surface) in their respective stockpiles for salvage;
- Excavate the CAMU cell to lines and grades shown on the drawings;
- Stockpile clay-rich soils and sandier soils separately. Segregation limits to be determined by the Engineer and concurred by the Contractor;
- Load, haul and place excavated soils in designated stockpile for salvage;

- Provide water as needed for dust suppression;
- Utility locates and, if required, utility relocation;
- Site grading as needed to blend removed excavation stockpile areas into adjacent topography and restore disturbed areas to original grades;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. The quantity of Excavation & Stockpile is the neat line staked quantity (as shown on the drawings and staked in the field) calculated in cubic yards using the average end area method. Re-measurements will be made only when 1) excavated areas outside the staked lines and grades are authorized by the Owner or 2) when there is disagreement over the accuracy of quantities computed from the staked lines and grades. Either party may require re-measurement of specific work items. No allowance will be made in measurement for payment for settlement and/or consolidation of the foundation. No allowance will be made for ramps into excavated areas. Segregating soils into separate stockpiles is incidental to this item.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Excavation & Stockpile.

109.11.08 Subgrade Preparation, Grade & Compact

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment

(b) Work Included.
- Plowing, disking and any moistening required to obtain proper compaction of the bottom and sides of the CAMU cell;
- Grade and compact subgrade;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Maintaining positive drainage;
- Remove and replace soft or otherwise unsatisfactory material with satisfactory material as directed by the Engineer;
- Low areas resulting from the removal of unsatisfactory material shall be brought up to the required grade with satisfactory materials, and the entire subgrade shall be shaped to the line, grade and cross-section and compacted as specified;
- Provide and apply water as needed for compaction and dust suppression;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement shall be made to the nearest square yard of Subgrade Preparation. Measurement for payment of Subgrade Preparation will be made to the neat lines, grades, and slopes of the CAMU cell bottom and sides shown on the Drawings and as staked in the field.

(d) Payment. This item will be paid for at the Contract unit price bid per square yard of Subgrade Preparation, Grade & Compact.

109.11.09 Compacted Clay Liner

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment and additions or amendments which follow.

(b) Work Included.
- Soils suitable for Compacted Clay Liner will be identified by the Engineer and concurred by the Contractor;
- Loading, hauling, placing and compacting clay soils from stockpiled excavation material;
- Compaction shall be accomplished by sheepsfoot rollers and 6-inch lifts;
- Roll surface smooth and prepare surface for HDPE installation;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance of the bottom and sides of the CAMU cell;
- Maintaining positive drainage;
- Remove and replace soft or otherwise unsatisfactory material with satisfactory material as directed by the Engineer;
- Low areas resulting from the removal of unsatisfactory material shall be brought up to the required grade with satisfactory materials, and the entire subgrade shall be shaped to the line, grade and cross-section and compacted as specified;
- Provide and apply water as needed for compaction and dust suppression;
- Any additional work required on the embankment to accomplish uniform moisture application;
- All other operations required to secure adequate bond between embankment in place and embankment to be placed;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Compacted Clay Liner will be made of the material in place in the completed embankment to the neat lines, grades, slopes, and thicknesses shown on the Drawings. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of liner installation will be used in computing the quantity of embankment placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the foundation or of the material

in the landfill embankment and fill. In measuring embankment and fill for payment, the volume of structures, of specially compacted earth fill, and of other work for which items for payment are provided in the schedule, will be deducted.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Compacted Clay Liner. It may be feasible to transport some of the materials which are excavated for other portions of the work and which are suitable for CCL directly to the CCL at the time of making the excavations, but the Contractor shall be entitled to no additional compensation above the unit prices Bid in the schedule by reason of it being necessary, or required by the Owner or regulating agencies, that such excavated materials be deposited temporarily in stockpiles and handled prior to being placed in the CCL.

109.11.10 HDPE, 60 mil

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 622 Geosynthetics Construction
- Section 623 Flexible Membrane Liner
- Section 713 Miscellaneous Materials

(b) Work Included.

- Material submittals (60 mil HDPE and panel drawings);
- Quality control tests;
- Furnish, place, join and anchor HDPE, 60 mil for primary and secondary liners;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials and incidentals necessary to install HDPE, 60 mil as shown on the plans and described in Specification Section 623, Flexible Membrane Liner.

(c) Measurement. Measurement shall be made to the nearest square yard of HDPE liner installed. Measurement for payment of HDPE liner will be made of the material in place to the neat lines, grades, and slopes shown on the Drawings. No allowance will be made in measurement for payment for waste, repairs, overlap or liner in anchor trenches.

(d) Payment. This item will be paid for at the Contract unit price bid per square yard for HDPE, 60 mil. Payment under all items of HDPE, 60 mil construction shall include the costs of furnishing, placing, joining, and anchoring the HDPE, 60 mil.

109.11.11 Drainage Geonet, 250 mil

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 622 Geosynthetics Construction
- Section 623 Flexible Membrane Liner
- Section 713 Miscellaneous Materials

(b) Work Included.
- Material submittals (Geonet, 250 mil, and panel drawings);
- Quality control tests;
- Furnish, place, join and anchor 250 mil geonet for primary and secondary liners;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials and incidentals necessary to install Drainage Geonet as shown on the plans and described in Specification Section 623, Flexible Membrane Liner.

(c) Measurement. Measurement shall be made to the nearest square yard of Drainage Geonet, 250 mil liner installed. Measurement for payment of geonet construction will be made of the material in place to the neat lines, grades, and slope shown on the Drawings. No allowance will be made in measurement for payment for waste, repairs, overlap or material in anchor trenches.

(d) Payment. This item will be paid for at the Contract unit price bid per square yard for Drainage Geonet, 250 mil. Payment under all items of geonet construction shall include the costs of furnishing, placing, joining, and anchoring the geonet.

109.11.12 Geotextile Construction Fabric

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 622 Geosynthetics Construction
- Section 623 Flexible Membrane Liner
- Section 713 Miscellaneous Materials

(b) Work Included.
- Material submittals (Geotextile - Separation, Geotextile – Drainage);
- Quality control tests;
- Furnish, place and anchor Separation Geotextile and Drainage Geotextile as shown on Drawings;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials and incidentals necessary to install Geotextile Construction Fabric as shown on the plans and described in Specification Section 623, Flexible Membrane Liner.

(c) Measurement. Measurement shall be made to the nearest square yard of Geotextile Construction Fabric installed. Measurement for payment of geotextile will be made of the material in place to the neat lines, grades, and slopes shown on the Drawings. No allowance will be made in measurement for payment for waste, repairs, overlap or material in anchor trenches. Both separation and drainage geotextiles are included in this item.

(d) Payment. This item will be paid for at the Contract unit price bid per square yard for geotextile Construction Fabric. Payment under all items of Geotextile Construction Fabric construction shall include the costs of furnishing, placing, joining, and anchoring the Geotextile Construction Fabric.

109.11.13 Leachate Collection & Removal System

a) General. Perform work in accordance with the following Standard Specifications:
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses
- Section 701 Aggregates
- Section 707 Joint Materials
- Section 708 Concrete, Plastic, and Fiber Pipe

(b) Work Included.
- Materials submittals (pipe, aggregate);
- Furnish and install all pipe, fittings, bedding and grading necessary to complete the work as shown in the drawings;
- Furnish and install drainage sumps and removal pipes and appurtenances (end caps, fittings, etc.);
- Provide, place and compact granular fill pipe bedding and backfill (gravel and sand) as required in Project Drawings;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Leachate Collection & Removal System. Drainage sumps and removal pipes and appurtenances will not be measured but will be incidental to this item.

109.11.14 Runoff Control Pond

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 201 Clearing and Grubbing
- Section 203 Excavation and Embankment

(b) Work Included.

- Material submittals (riprap);
- Strip and stockpile topsoil and subsoil;
- Excavate pond, stockpile excavated soils;
- Provide water as needed for dust suppression;
- Provide and install riprap slope drain and all surface water controls as shown in the drawings;
- Replace topsoil;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Runoff Control Pond.

109.11.15 Health & Safety Requirements

(a) General. Perform work in accordance with the following:

- Special Provision Section 110 Safety
- OSHA 29 CFR 1926.65 (HAZWOPER)
- OSHA 1926.62 (lead)
- OSHA 1926.1118 (arsenic)
- OSHA 1926.1127 (cadmium)
- All applicable regulations and specifications

(b) Work Included.

- Identify and meet all safety standards that are applicable to this project;
- Provide all personnel working on the project with required orientation and training on the potential hazards anticipated and the appropriate use of safety equipment;
- Provide the Engineer adequate proof of required employee HAZWOPER training requirements;
- Require all Contractor employees working on the Asarco East Helena Plant site and/or handling materials being placed into the CAMU repository to attend the Asarco Contractor Safety training session. Contractor will be responsible for Contractor employee wages while attending this training session;
- Monthly and weekly safety meetings shall be considered incidental;
- Develop and maintain for the duration of work activities at the Site, a written Site Health and Safety Plan that will effectively incorporate and implement all applicable requirements;
- As part of the Site Health and Safety Plan, develop and maintain for the duration of work activities at the Site, a written monitoring program as specified herein, to provide information necessary to comply with relevant worker health and safety regulations;
- Make appropriate corrective actions as required for compliance;

- The costs for medical surveillance exams and biological monitoring shall be considered incidental;
- All required reporting shall be considered incidental;
- Any work necessary to comply with the requirements of Section 110, but not specifically mentioned, shall be incidental to the Health and Safety Requirements, and all costs therefore shall be included in the unit Contract prices of the Bid items;
- Provide all required personal protective equipment with the exceptions of required respirators and coveralls;
- Provide a full time Site Safety Officer;
- During waste placement phase, require Contract employees to shower prior to leaving the job site. Contractor will be responsible for Contractor employee wages while showering;
- Require Contract employees to be fitted for a respirator by Asarco. Contractor will be responsible for Contractor employee wages when being fitted for a respirator (approximately 30 - 45 minutes).
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified;

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Health & Safety Requirements. All items of work and all incidentals as specified in Special Provisions Subsection 110.02, HEALTH AND SAFETY REQUIREMENTS FOR HAZARDOUS WASTE OPERATIONS, are for work performed at the Asarco East Helena CAMU Phase 1 Cell Construction Project. Fifty percent payment will be allowed once these requirements are met. Twenty-five percent will be allowed at the beginning of the Waste Placement Phase and 25% at completion of the Waste Placement Phase.

109.11.16 Site Access & Traffic Controls

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 201 Clearing and Grubbing
- Section 202 Removal of Structures and Obstructions
- Section 203 Excavation and Embankment
- Section 206 Haul
- Section 607 Fences
- Section 618 Traffic Control
- Section 712 Fencing Materials
- Section 715 Traffic Control Devices

(b) Work Included.
- Prepare, submit, revise as required and maintain an approved Traffic Control Plan;
- Fees associated with obtaining county road permit;
- Provide all required traffic controls (labor, material, equipment, signs);
- Construct all temporary fences, including orange poly fence as needed to control access to the site;

- Construct all temporary gates needed to control access to the site;
- Gates in existing fences at access road crossings are under a separate item;
- All work necessary to prevent public and wildlife access to the CAMU site;
- Construct and maintain detour routes as needed;
- Provide water as needed for compaction and dust suppression;
- Conduct layout, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Site Access & Traffic Controls. Interim payments will be prorated to percent of project completion.

109.11.17 Dust Control

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment

(b) Work Included.
- Dust Control Plan preparation, submittal; and revisions as required for owner approval;
- Minimize the creation and spread of dust during the excavating and loading on the plant, and placing and compacting activities in the CAMU and stockpiles;
- The Owner will supply non-potable water for compaction and dust suppression at fill station standpipes on the plant. The Contractor will be required to transport water to the point of use;
- A fine mist of water will be utilized to minimize dust during loading activities;
- Dust control for hauling operations on paved access roads is under a separate item;
- Watering will be required during hauling, placing and compacting activities as needed for dust control; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Dust Control. Interim payments will be prorated to percent of project completion.

109.11.18 Haul Road Maintenance

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment

(b) Work Included.

- Dust Control Plan preparation and submittal is under a separate item;
- The Contractor will conduct continuous sweeping of the access roads using a dry vacuum sweeper during hauling operations;
- The Owner will supply non-potable water for compaction and dust suppression at fill station standpipes on the plant;
- Solid bottom hauling vehicles will be used to minimize leakage potential;
- Road maintenance as required to maintain the surface without ruts, potholes or other deterioration;
- Watering for suppression if sweeping alone is not able to control dust; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Haul Road Maintenance. Interim payments will be prorated to percent of project completion.

109.11.19 Load, Haul & Place Waste Materials

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 201 Clearing and Grubbing
- Section 202 Removal of Structures and Obstructions
- Section 203 Excavation and Embankment
- Section 206 Haul

(b) Work Included.

- Load, haul, place, spread and compact waste materials and debris in CAMU;
- Use two feet of Lower Lake sediments as a cushion soil against bottom and sides of cell liner above the geotextile and approximately 1.5 feet of sediments above the waste material below the compacted clay cover;
- Cut and flatten metal items as necessary to minimize voids;
- No voids greater than one cubic foot will be allowed;
- Owner will require placement of debris with soils in a manner that forms a homogeneous waste in CAMU (i.e. not all debris placed together but mixed relatively evenly throughout the CAMU);
- No additional expenses will be allowed to consolidate waste materials to Owner's satisfaction;
- Haul trucks will be covered and will have gate seals. The contractor is required to apply gasket material or otherwise modify haul truck gates to ensure that the gates are tightly sealed. The Contractor is required to maintain gates in this condition;
- Place long debris items (e.g., timbers, pipe, steel beams, etc.) horizontally in the fill lifts;
- Salvage, roll and stockpile Lower Lake sediment cover after stockpile is totally removed;

- After waste piles are removed in the Ore Storage Yard, sweep clean all paved areas previously covered by stockpiles. Final sweeping of paved areas is incidental to the Load, Haul & Place Waste Materials item;
- After waste piles are removed in the Ore Storage yard, grade all unpaved areas to blend with existing topography. Waste piles will be removed to natural ground elevations or as staked by the Engineer in the field. Final grading of unpaved areas is incidental to the Load, Haul & Place Waste Materials item;
- Break oversized concrete debris to meet size restrictions;
- Stockpile large, unsuitable large metal debris at designated plant area;
- Stockpile other items designated for salvage (concrete, jersey barriers, etc.);
- Maintaining positive drainage at waste piles and CAMU sites;
- Provide water as needed for compaction and dust suppression;
- Compaction of wastes by sheepsfoot rollers in 2-foot lifts;
- Crush plastics, ceramic and glass material in compaction process to minimize voids;
- Supplementary wetting of the fill, if necessary;
- Preparing bonding surfaces;
- All other operations required to secure adequate bond between embankment in place and embankment to be placed;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Load, Haul & Place Waste Materials will be made of the material in place in the completed CAMU embankment. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of waste material placement, compaction and grading the landfill cell will be used in computing the quantity of embankment placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the material in the landfill.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Load, Haul & Place Waste Materials.

109.11.20 Gas Migration Layer

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment
- Section 301 Aggregate Surfacing
- Section 303 Stockpiled Surfacing Aggregate
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses
- Section 701 Aggregates
- Section 708 Concrete, Plastic, and Fiber Pipe

(b) Work Included.

- Material submittals (pipe, aggregate, liner, boots);
- Maintaining positive drainage;
- Provide, place and compact gas migration layer aggregate;
- Furnishing and installing all pipe, fittings, and grading necessary to complete the gas collection piping as shown in the drawings is incidental to this item;
- Furnishing and installing all pipe, fittings, and grading necessary to complete the stand pipe and vents work as shown in the drawings is incidental to this item;
- Concrete blocks and incidentals at HDPE liner boots and seals;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Gas Migration Layer will be made of the material in place in the completed embankment to the line, grade, slope, and thickness as staked in the field and shown on the Drawings. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of the gas migration layer will be used in computing the quantity of embankment placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the landfill embankment. All piping and associated incidentals are will not be measured but are incidental to this item.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Gas Migration Layer.

109.11.21 Compacted Clay Cover

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 203 Excavation and Embankment

(b) Work Included.

- Load, haul, place and compact clay soils from stockpiles of excavated soils from CAMU cell;
- Compaction shall be accomplished by sheepsfoot rollers in 6-inch lifts;
- The entire cover shall be shaped to the line, grade and cross-section and compacted as specified;
- Roll and prepare surface for installation of HDPE liner;
- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Maintain positive drainage during construction operations;
- Provide water as needed for compaction and dust suppression;
  Supplementary wetting of the fill, if necessary;

- Any additional work required on the embankment to accomplish uniform moisture application;
- Preparing bonding surfaces;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Compacted Clay Cover will be made of the material in place in the completed embankment to the neat lines, grades, slopes, and thicknesses as staked in the field and shown on the Drawings. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of compacted clay cover will be used in computing the quantity of compacted clay embankment placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the foundation or of the material in the landfill embankment and fill.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Compacted Clay Cover.

109.11.22 HDPE, 40 mil

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 622 Geosynthetics Construction
- Section 623 Flexible Membrane Liner
- Section 713 Miscellaneous Materials

(b) Work Included.
- Material submittals (HDPE, 40 mil);
- Quality control tests;
- Furnish, place, join and anchor HDPE, 40 mil;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials and incidentals necessary to install HDPE, 40 mil as shown on the plans and described in Specification Section 623, Flexible Membrane Liner.

(c) Measurement. Measurement shall be made to the nearest square yard of HDPE liner installed. Measurement for payment of HDPE, 40 mil liner will be made of the material in place to the neat lines, grades, and slopes as staked in the field or shown on the Drawings. No allowance will be made in measurement for payment for waste, repairs, overlap or liner in anchor trenches.

(c) Payment. This item will be paid for at the Contract unit price bid per square yard for HDPE, 40 mil. Payment under all items of HDPE, 40 mil construction shall include the costs of furnishing, placing, joining, and anchoring the HDPE, 40 mil.

109.11.23 Cap Drainage Collection, 4" HDPE

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses
- Section 708 Concrete, Plastic, and Fiber Pipe

(b) Work Included.
- Material submittals (pipe);
- Furnish and install all pipe, fittings and grading necessary to complete the work as shown in the drawings;
- Provide, place and compact granular fill pipe bedding under a separate bid item;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will be made on the pipeline along the top of the pipe or along a line parallel thereto.

(d) Payment. This item will be paid for at the Contract unit price bid for Cap Drainage Collection, 4" HDPE. The Engineer may increase or decrease portions of the planned quantity to meet field conditions. In the case of a quantity reduction, the Owner will not be obligated to purchase excess materials from the Contractor.

109.11.24 Drainage Layer Gravel

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment
- Section 301 Aggregate Surfacing
- Section 303 Stockpiled Surfacing Aggregate
- Section 701 Aggregates

(b) Work Included.
- Material submittals (aggregate);
- Furnish, place, grade and roll drainage layer gravel;
- Maintain positive drainage;
- Provide water as needed for compaction and dust suppression;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Drainage Layer Gravel will be made of the material in place in the completed embankment to the neat lines, grades, slopes, and thicknesses as

staked in the field and shown on the Drawings. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of the drainage layer will be used in computing the quantity of drainage gravel placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation landfill embankment. In measuring fill for payment, the volume of structures, and of other work for which items for payment are provided in the schedule, will be deducted.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard Drainage Layer Gravel.

109.11. 25 Cap Drainage Culvert, 6" HDPE

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 603 Culverts, Storm Drains, Sanitary Sewers, Stockpasses, and Underpasses
- Section 708 Concrete, Plastic, and Fiber Pipe

(b) Work Included.
- Material submittals (pipe);
- Furnish and install all pipe, fittings, bedding and grading necessary to complete the work as shown in the drawings;
- Trench excavation and backfill required for pipe installation;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will be made on the pipeline along the top of the pipe or along a line parallel thereto.

(d) Payment. This item will be paid for at the Contract unit price bid for Cap Drainage Culvert, 6" HDPE. The Engineer may increase or decrease portions of the planned quantity to meet field conditions. In the case of a quantity reduction, the Owner will not be obligated to purchase excess materials from the Contractor.

109.11.26 Cover Soil Layer

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment

(b) Work Included.
- Load, haul, place and compact topsoil and subsoil from stockpiles;
- Compaction shall be accomplished by sheepsfoot rollers;
- Finished surface shall be shaped to the line, grade and cross-section and compacted as specified;

- Costs for quality control and compaction tests associated with re-testing because of non-compliance;
- Maintain positive drainage;
- Provide water as needed for compaction and dust suppression;
- Supplementary wetting of the fill, if necessary;
- Any additional work required on the embankment to accomplish uniform moisture application;
- Preparing bonding surfaces;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Cover Soil Layer will be made of the material in place in the completed embankment to the neat lines, grades, slopes, and thicknesses as staked in the field and shown on the Drawings. Pre-construction surveys will determine initial surface elevations. The cross-sections obtained by surveys made after completion of cover soil layer will be used in computing the quantity of cover soil embankment placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the landfill embankment.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Cover Soil Layer.

109.11.27 Permanent Run-on Diversion Ditches

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 203 Excavation and Embankment
- Section 208 Water Pollution Control and Stream Preservation

(b) Work Included.
- Excavate diversion ditches as shown on the drawings or staked in the field by the Engineer;
- Compact a berm on the downhill side of the ditch with excavated material as shown on the plans;
- Grade finished ditch section to blend with adjacent topography;
- Prevent run-on from running into excavations or onto disturbed areas;
- Provide water as needed for compaction and dust suppression;
- Maintain positive drainage;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will be made in the diversion ditch or along a line parallel thereto, as staked by the Engineer in the field.

(d) Payment. This item will be paid for at the Contract unit price bid for Permanent Run-on Diversion Ditches. The Engineer may increase or decrease portions of the planned quantity to meet field conditions.

109.11.28 Seed, Fertilize, & Mulch – Off Plant

(a) General. Perform work in accordance with the following Standard Specifications:
- Special Provision Section
- Section 610 Roadside Re-Vegetation
- Section 713 Miscellaneous Materials
- Section 111 Soil Amendments, Seedbed Preparation and Seed Mix

(b) Work Included.
- Material submittals (seed, fertilizer, mulch);
- Submit required certifications for approval;
- Prepare seedbed, seed, fertilize and mulch all off-plant disturbed areas downhill (north) from permanent diversion ditches;
- Preparing seedbed after top soil grading and final surface is approved;
- Furnish, apply and incorporate fertilizer;
- Furnish and plant seed and water;
- Furnish, apply and crimp vegetative mulch;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item;
- Reapplication of seed, fertilizer and mulch if the initial seeding does not germinate;
- Weed control as nesessary; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured by the number of acres outside the plant boundary fence and downhill of the permanent diversion ditch upon which the specified amount of seed, fertilizer and mulch have been applied. Acreage will be measured to the nearest 0.1 acre.

(d) Payment. This item will be paid for at the Contract unit price bid per acre for Seed, Fertilize, & Mulch Off-Plant.

109.11.29 Seed & Mulch-Agricultural

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 610 Roadside Re-Vegetation

- Section 713 Miscellaneous Materials
- Special Provision Section 111 Soil Amendments, Seedbed Preparation and Seed Mix

(b) Work Included.
- Material submittals (seed, mulch);
- Submit required certifications for approval;
- Prepare seedbed, seed and mulch all disturbed areas uphill (south) of permanent run-on diversion ditches;
- Preparing seedbed only after certification;
- Furnish and plant seed and water;
- Furnish, apply and crimp vegetative mulch;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item;
- Reapplication of seed and mulch if the initial seeding does not germinate;
- Weed control as necessary; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured by the number of acres uphill (south) of the permanent run-on diversion ditch upon which the specified amount of seed and mulch have been applied. Acreage will be measured to the nearest 0.1 acre.

(d) Payment. This item will be paid for at the Contract unit price bid per acre for Seed & Mulch - Agricultural.

109.11.30 Chain Link Fence with Appurtenances

(a) General. Perform work in accordance with the following Standard Specifications:
- Section 201 Clearing and Grubbing
- Section 607 Fences
- Section 712 Fencing Materials and in accordance with the Plans.

(b) Work Included.
- Material submittals (fence) and shop drawings;
- All layout, grading and clearing;
- Furnish and install fence fabric, fence wire, steel posts, cable, rail, top caps, end and corner posts, gates, panels, braces, brackets and required hard ware;
- Excavation required for fence installation is incidental to this item;
- Concrete post backfill, anchors and deadmen are incidental to this item;
- Furnish project signs and mount on fence is incidental to this item;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. This item will be measured in place by the linear foot. The measurement will include gates. The measurement will be made on the fence line along the top wire or along a line parallel thereto, from end post to end post as shown on the Drawings and staked in the field.

(d) Payment. This item will be paid for at the Contract unit price bid for Chain Link Fence with Appurtenances. The Engineer may increase or decrease portions of the planned quantity of fence to meet field conditions. In the case of a quantity reduction, the Owner will not be obligated to purchase excess materials from the Contractor.

109.11.31 Construction Surveys

(a) General. Perform work in accordance with the special provisions, standard engineering practices, and Section 203 – Excavation and Embankment.

(b) Work Included.

- The Contractor will complete all surveys and furnish all stakes, markers, tools and equipment required to lay out the work from bench marks and/or control point markers indicated by the Engineer;
- Conduct layout, grade and quality control, quantity determination, and as-built field surveys;
- Provide Engineer with copy of survey data within 48 hours of completing each survey;
- The Contractor will not disturb existing survey monuments or bench marks without the consent of the Engineer;
- A licensed land surveyor will replace markers/monuments that are accidentally disturbed by earthwork operations at the Contractor's expense;
- The Engineer will provide field survey control benchmarks as necessary for the Contractor to establish project construction control;
- Existing groundwater monitoring wells will not be disturbed;
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(d) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Construction Surveys. Twenty-five percent payment will be allowed after the initial project (CAMU) layout is completed, 25% at completion of the Excavation Phase, 25% at the completion of the Waste Placement Phase and 25% at completion of the Capping and Closure Phase.

109.11.32 Quality Control Plan and Management

(a) General. Perform work in accordance with the Special Provision Subsection 104.09.1, Scope of Work.

(b) Work Included.

- Prepare, submit and revise as required, an approvable Quality Control Plan per the Special Provisions;
- Construction photographs are incidental to this item;
- Preparation and submittal of Daily Construction Reports is incidental to this item;
- As-Built Drawing preparation, daily updates and final submittals are incidental to this item;
- Construction quality control management expenses are incidental to this item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement and Payment. No measurement of this bid item will be made. This item will be paid for at the contract lump sum price bid for Quality Control Plan. All items of work and all incidentals as specified in Special Provisions Subsection 104.09.1 are for work performed at the Asarco East Helena CAMU Phase 1 Cell Construction Project. Twenty five percent (25%) payment will be allowed once the Quality Control Plan is approved. The remaining 75% will be prorated to percent of project completion.

109.11.33 Compacted Clay Cap at Former Southeast Stockpile Area

(a) General. Perform work in accordance with the following Standard Specifications:

- Section 201 Clearing and Grubbing
- Section 203 Excavation and Embankment
- Section 206 Haul

(b) Work Included.

- This work item is considered part of the Waste Placement phase and applicable Health and Safety requirements apply;
- After waste piles are removed, grade the area between the lakes as indicated on the drawings and staked in the field;
- Compact subgrade to 90% maximum dry density at depth of 6 inches;
- Load, haul from stockpile near CAMU, place, spread, grade and compact clay cap over designated disturbed areas;
- Conduct layout, quantity determination, quality control and as-built field surveys under a separate item; and
- Provide all labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.

(c) Measurement. Measurement of Compacted Clay Cap at Former Southeast Stockpile Area will be made of the material in place in the completed embankment to the neat lines, grades, slopes, and thicknesses as staked in the field and shown on the Drawings. Pre-construction surveys will determine initial surface elevations after waste piles are removed, the area is graded and compacted. The cross-sections obtained by surveys made after completion of the compacted clay cap will be used in computing the quantity of compacted clay embankment

placed. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the fill or subgrade.

(d) Payment. This item will be paid for at the Contract unit price bid per cubic yard of Compacted Clay Cap at Former Southeast Stockpile Area.

SECTION 110 - SAFETY

Add the following new section.

SECTION 110 - SAFETY

110.01 GENERAL REQUIREMENTS (Applies to Groups A, B and C)

The Contractor shall be responsible for identifying and meeting all safety standards that are applicable to this project. The Contractor shall hold harmless the Owner and Owners Representative from any claims made as a result of the Contractor's neglect in this regard.

For all work conducted on the Project, the Contractor shall ensure compliance with all safety and health provisions of the Federal Occupational Safety and Health Administration (OSHA) regulations and all other applicable federal, state, county, and local laws, regulations, ordinances, and codes. The Contractor shall also ensure compliance with requirements set forth herein, and any regulations that may be specified in other places within this contract. The Contractor's failure to thoroughly familiarize itself with the aforementioned safety and health provisions shall not relieve the Contractor of responsibility for full compliance with the obligations and requirements set forth therein.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use or operation. The Contractor shall be solely and completely responsible for the conditions at the Site, including safety and health of all authorized persons and property in performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of the Owners Representative to conduct construction review of the Contractor's performance shall be intended to include review of the Contractor's proposed safety and health measures in, on or near the site, and does not relieve the Contractor of responsibility for compliance with applicable laws, regulations and requirements.

The Contractor shall observe and comply with all applicable laws, regulations and requirements of Section 110. Such information, interpretation, or representation of laws, regulations, or ordinances referenced in the Contract Documents shall not take precedence over the law, regulation, of ordinance itself, nor relieve the Contractor of responsibility for determining the true current construction and content of such laws, regulations and ordinances.

The Contractor shall not permit any employee, in the performance of the Contract, to work under conditions that are hazardous to the employee. Should violations of the safety and health requirements be called to the Contractor's attention by the Owners Representative or any authorized representative of a regulatory agency, the Contractor shall immediately correct the identified conditions.

In the event the Contractor fails or refuses to promptly comply with any compliance directive, the Owners Representative may issue an order to stop all or any part of the work. When compliance with the directive issue is accomplished, an Order to resume work will be issued. The Contractor shall not be entitled to any extension of time or any claim for damage or to any additional compensation for either the directive or the work suspension order. Failure of the Owners Representative to order discontinuance of any or all of the Contractor's operations shall not relieve the Contractor of responsibility for safety.

The Contractor shall maintain in a manner acceptable to the Owners Representative an accurate record of, and shall report to the Owners Representative cases of death, occupational diseases, recordable injuries as defined by OSHA or any injury to the public incident to the performance of work under this Contract.

For the period of time during waste placement in the landfill and until final covering of the landfill with the HDPE/FML, the Contractor shall comply with all specified Safety and Health laws, regulations and requirements for Hazardous Waste Site Operations according to OSHA regulations 29 CFR 1926.65 (HAZWOPER). The Contractor will also comply with the OSHA substance specific standards for lead (29 CFR 1926.62), arsenic (29 CFR 1926.1118), cadmium (29 CFR 1926.1127) and asbestos (29 CFR 1926.1101). Only fully trained personnel may work on the site during this time period.

Also, the topsoil at the CAMU location contains low levels of lead. Stripping operations of this soil and the placement of this soil as top cover will be regulated according to OSHA's lead regulation.

For other periods of time when the above activities are not being performed (e.g. construction of the CAMU repository), work will not be regulated under the HAZWOPER, lead, arsenic, and cadmium standards. However, the Contractor is responsible for meeting all safety standards that are applicable to this portion of the project.

110.02 SAFETY AND HEALTH REQUIREMENTS FOR HAZARDOUS WASTE OPERATIONS (Applies to Group C)

110.02.1 Hazardous Waste Operations

For the period of time when waste is being excavated and placed in the landfill until the final covering of the repository with the HDPE/FML, in addition to the requirements of paragraph 110.01, work will be regulated under OSHA standards 29 CFR 1926.65 (HAZWOPER), 29 CFR 1926.62 (Lead), 29 CFR 1926.1118 (Arsenic), 29 CFR 1926.1127 (Cadmium) and 29 CFR 1926.1101 (Asbestos). The materials being excavated and transported to the CAMU repository contain elevated levels of lead, arsenic and cadmium. Asbestos may also be encountered in materials being excavated and transported to the CAMU repository. The Contractor is responsible for compliance with these regulations and the requirements of paragraph 110.02.

110.02.2 Site Safety Officer

The Contractor shall appoint a Site Safety and Health Officer who has experience in industrial hygiene, such as an Industrial Hygienist certified by the American Industrial Hygiene Association or approved equal and who is qualified by experience and training in hazardous waste operations. The Site Safety and Health Officer shall be qualified and authorized to monitor, supervise and enforce compliance with the Site Safety and Health Plan. A resume of the Site Safety and Health Officer's qualifications shall be submitted to the Owners Representative for review within ten (10) days of receiving the Notice to Proceed. The site Safety and Health Officer shall be present on-site at times during the period of time during waste excavation and placement in the CAMU repository until final covering of the repository with HDPE/FML or when the potential for encountering hazardous substances or situations exists. The Site Safety and Heath Officer shall immediately notify the Owners Representative of any emergencies as soon as possible following an incident.

110.02.3 Personal Air Monitoring

The Owner's representative shall perform personal air monitoring to determine Contractor worker exposures to lead, arsenic, cadmium and asbestos. Personal air monitoring will be done using OSHA accepted methods.

The frequency of monitoring will be done in accordance with OSHA standards for lead, arsenic, cadmium and asbestos.

110.02.4 Personal Protective Equipment

As part of the Site Safety and Health Plan, the Contractor shall be responsible for contractor workers wearing required Personal Protective Equipment (PPE).

Required PPE includes a hard hat, safety glasses, hard-toed boots, coveralls, and respirator. The respirator needs to be used when driving vehicles, when there is dust in the air, when operating equipment, when handling materials destined for the CAMU repository, when handling any ground materials within the plant site, when stripping and handling topsoil material at the CAMU site and when personal air monitoring indicates respirators need to be worn. At all other times, the respirator needs to be worn around the neck.

Asarco will provide clean respirators and coveralls. Asarco will also provide respirator fit testing services. The Contractor will be responsible for Contractor employee wages while being fitted for a respirator (30 - 45 minutes). The Contractor will be responsible for ensuring all other PPE is available.

110.02.5 Medical Monitoring

The Contractor is responsible for the Contractor employees medical monitoring program. For Contractor employees on this Site for more than 30 days, an initial medical examination and

biological monitoring is required according to the OSHA standards for lead, arsenic, cadmium and asbestos. For Contractor employees on site for less than 30 days, only an initial blood lead analysis is required per the OSHA lead standard, unless the Contractor employee has been exposed to these substances for more than 30 days in the past 12 months.

The Contractor is also responsible to provide Contractor employees a medial examination to determine the employee" ability to use a respirator.

All Contractor employees will be required to have completed the medical examinations and biological monitoring prior to attending Asarco's Contractor Safety Training covered in paragraph 110.02.6.

The Contractor is responsible for subsequent medical monitoring including biological monitoring for lead every two (2) months for the first six (6) months of exposure. In addition to the requirements of OSHA standards, all Contractor employees will be required to receive subsequent medical examinations using medical procedures covered in the OSHA standards for lead, arsenic, cadmium and asbestos every six (6) months.

For each employee, the Contractor shall provide to the Owners Representative a statement from a licensed physician indicating that the employee can work in a lead, arsenic, cadmium and asbestos environment and that the employee is capable to use a respirator. Also, the Contractor shall provide to the Owners Representative a copy of each employee's biological monitoring results.

110.02.6 Training

Contract workers are required to receive training according to the OSHA HAZWOPER, lead, arsenic and cadmium standards. Contract workers are also required to receive training according to the OSHA asbestos standard (see Subsection 110.02.9).

The Contractor will provide the Owners Representative copies of each Contractor employees HAZWOPER training certificates at least five (5) days prior to beginning construction. Specific HAZWOPER training certificates includes the initial 40-hour, initial 8-hour supervisory training for supervisors, and current 8-hour refresher training.

All Contractor workers will be required to attend the Contractor Safety Training provided by Asarco. This training will cover the hazards workers potentially may encounter while on the plant site (including health hazards associated with lead, arsenic and cadmium), site rules, and emergency alarm systems and escape routes. The duration of this training will not exceed 2 hours. The Contractor will be responsible for Contractor employees' wages while attending the Asarco Contractor Safety Training session.

The Contractor is responsible for providing its workers training regarding requirements of the Site Specific Health and Safety Plan. The Contractor will provide the Owners Representative

documentation of each Contractor employee receiving this training. The Contractor is also responsible for all other required OSHA training specific to activities on this project.

Any training given by Asarco does not relieve the Contractor from responsibility for compliance with OSHA training requirements.

110.02.7 Decontamination

Contract workers will be required to shower prior to leaving the project site. Showers are to be completed during work hours. Asarco will provide the shower and change facilities.

Equipment leaving the project site will be cleaned using the wash bay facility located at the plant site.

110.02.8 Health and Safety Plan

The Contractor shall develop and maintain for the duration of work activities at the Site a written Site Safety and Health Plan. This plan shall be submitted by the Contractor to the Owners Representative within ten (10) days after receiving the Notice to Proceed. This plan shall be in accordance with the OSHA HAZWOPER, lead, arsenic, and cadmium standards. It is the Contractor's responsibility for implementing a safety program to protect workers from all safety and health hazards associated with this project. The Site Safety and Health Plan shall be available on the site for inspection by employees, their representatives, the Owners Representative, and regulatory personnel.

The Site Safety and Health Plan for work activities at the Site shall, at a minimum, include the following considerations:

1) Names of Key personnel and their roles, responsibilities, and scope of authority be clearly defined.

2) Safety and Health Risk analysis for each site task and operation.

3) Employee training requirements.

4) Engineering controls, work practices, and/or personal protective equipment to be used for each of the site tasks and operations being conducted.

5) Medical Surveillance requirements.

6) Frequency and types of air monitoring to be used. Methods of maintenance and calibration of monitoring equipment to be used.

7) Site control measures including identifying exclusion zones, contamination reduction zones, and support zones. Owner will provide a lunchroom that will be considered a support zone in the Health and Safety Plan.

8) Decontamination Procedures for personnel and equipment will be included in this section.

9) Emergency response plan which includes:

   a) Methods of communication to Asarco in accordance with their existing General Disaster/Incident Response Plan
   b) Methods of communication to be used within the work site
   c) Develop immediate incident command system to be used until the Owner's General Disaster/Incident Response Plan is implemented.

10) Confined space entry procedures (if applicable)

11) Spill containment plan.

110.02.9 Asbestos

It is suspected that asbestos-containing materials (ACM) may be present in the wastepiles. This ACM may be in the form of transite siding, asbestos-cement pipe and pipe insulation (Thermal System Insulation, TSI). If ACM is encountered, Asarco will provide the supervision to handle, transport and place the ACM into the CAMU landfill. Contractor's crews will perform work associated with handling, transporting and placing ACM under the direct guidance of the Owner's designated Competent Person unless Asarco determines the work needs to be done by Asarco personnel.

During removal of waste piles, the Contractor is responsible for identifying and notifying the Owners Representative of any ACM. To assist the Contractor in identifying ACM, the Contractor is responsible to provide its employees involved in the removal of waste piles at least 8 hours of training as required by OSHA standard 29 CFR 1926.1101 (k)(9). The Contractor shall submit to the Owners Representative documentation that these employees have this training.

In the event the Contractor identifies ACM, the Contractor shall cease work in the immediate area containing ACM and immediately notify the Owners Representative. Asarco will decide the manner in which the ACM will be handled and the actual procedures to be used in resuming the work. Although the actual procedures used in resuming the work shall depend upon the amount of ACM, the Owners Representative foresees the following alternatives of operation as possible:

1) Contractor to resume work as before the suspension.

2) Contractor to move work operations to another portion of the site until measures to remove ACM can be effected.

110.02.10 Uncovering Unknown Waste Materials

In the event the Contractor exposes potentially hazardous unknown substances, such as drummed material, the Contractor shall immediately notify the Owners Representative. Depending upon the type of problem identified, the Owners Representative may suspend the work in the vicinity of the material discovery.

Following completion of any further investigation to determine the nature of the material, the Owners Representative will decide the manner in which the substance will be handled and the actual procedures to be used in resuming the work.

Although the actual procedures used in resuming the work shall depend upon the nature and extent of the potentially hazardous substance, the Owners Representative foresees the following alternatives of operation as possible:

1) Contractor to resume work as before the suspension.

2) Contractor to move work operations to another portion of the site until measures to eliminate any hazardous conditions can be effected.

3) The Owners Representative will direct the Contractor to move the suspect substance to another location.

110.03 SAFETY AND HEALTH REQUIREMENTS FOR MOVEMENT OF TOPSOIL FROM CAMU LOCATION (Applies to Group B)

Work in Group B is regulated by OSHA's construction lead standard. The requirements found in section 110.02 apply to the work in Group B, with the following exceptions:

110.03.1 Site Safety Officer

No Site Safety Officer is required. However, the Contractor needs to provide a safety representative according to Section X, Part 9b.

110.03.2 Medical Monitoring

Biological monitoring is required according to OSHA's lead standard. A full medical examination is not required unless personal air monitoring indicates exposures exceeding the action level for lead and the employee will work in a lead environment for 30 days or more in a 12-month period.

110.03.3 Training

HAZWOPER training is not required to Group B work.

Contract workers in Group B are to receive training according to the OSHA lead standard. All contract workers will be required to attend the Contractor Safety Training provided by Asarco to satisfy the OSHA required lead training.

The Contractor is responsible for all other required OSHA training specific to activitites on this project.

110.03.4 Health and Safety Plan

The Contractor does not need to develop and maintain a Site Safety and Health Plan for Group B work.

110.03.5 Asbestos

No asbestos is anticipated to be encountered during Group B work.

SECTION 111 - SOIL AMENDMENTS, SEEDBED PREPARATION, AND SEED MIX
Add the following new section:

SECTION 111 - SOIL AMENDMENTS, SEEDBED PREPARATION, AND SEED MIX

111.01.1 Soil Amendments, Seedbed Preparation, and Seed Mix

A. Topsoiling. Topsoil shall cover all embankment, backfill, site grading and exposed cut slope areas in accordance with Standard Specification 610. Application rates shall be a minimum of 4 inches at all sites unless otherwise designated in the specifications or on the Drawings.

B. Seedbed Preparation. After the project site has been graded to final plan specifications the site to be seeded shall be cultivated to provide a uniform seedbed surface. The seedbed shall be cultivated sufficiently to reduce the soil to a state of good tilth when the soil particles on the surface are small enough to lie closely enough together to prevent the seed from being covered too deeply for optimum germination. Prior to executing the seeding, fertilizing, and mulching work items, the seedbed at all sites shall be prepared and conditioned so these items can most efficiently be completed in conformance with Standard Specification 610. The seeding, fertilizing, and mulching work items shall be executed only after the seedbed has been accepted by the Engineer.

C. Seeding, Fertilizing, and Mulching. All areas at the sites disturbed in the execution of the work shall be seeded, fertilized, and mulched. These areas include that acreage disturbed under the designated work items.

Other areas which are disturbed by the Contractor's operation will also require seeding, fertilizing, and mulching. Any such disturbed areas will be considered as site damage and will not be measured or considered for payment. The cost of this work shall be absorbed solely by the Contractor.

All disturbed areas shall be seeded with the designated Grass Mix. Two mixes are provided. One mix is for use on land designated for return to agricultural use and the other applies to all other disturbed areas.

The Contractor shall accomplish this work in accordance with the Fertilizing and Seeding Subsection and the Mulching Subsection of Standard Specification 610, and also in accordance with the provisions contained herein.

(1) Fertilizer. Fertilizer shall be applied at the rates specified below. Exceptions will be made for seed drills that are capable of incorporating the fertilizer and seed directly into the seedbed uniformly at the specified rates. Fertilizer shall be applied to the

prepared seedbed prior to seeding or mulching and shall be blended with the topsoil as called for in Standard Specification 610, or concurrently with the seed (as "no till" drills allow).

Fertilizer shall be applied to the prepared seedbed prior to seeding. The fertilizer shall be incorporated into the soil by discing, raking, or shallow plowing to the full depth of the topsoil or to a maximum depth of 6 inches, whichever is less. Fertilizer shall be incorporated with equipment operated at right angles to the slope of the land.

All areas, except areas that will be returned to agricultural production within one year of project completion, shall be fertilized with a balanced inorganic chemical fertilizer with the following nutrients:

Composition 26-10-5 150 lbs/acre

All required fertilizer certificates shall be provided to the Engineer a minimum of three days prior to fertilizing. The certification shall include the guaranteed analysis of the fertilizer(s) stated in terms of the percentages of nitrogen (N), available phosphorus (P205) and potash (K20) in that order. The fertilizer specification may be changed by the Owner to a fertilizer mix based on specific site soil samples at no cost to the Owner.

(2) Seed Certification. Seed certifications as required by Standard Specification 610 shall be submitted to the Engineer prior to any seeding. The Contractor shall also submit a copy of the bill or other documentation from the seed supplier showing actual bulk weights of the individual seed types combined in the mix. The required certifications and documentation shall be provided to the Engineer at least three days prior to seeding.

(3) Seeding. The following application rates for seed are based on the drill seeding method. The seed mixture shall be uniformly distributed over the areas shown on project plans. All planting shall be done between October 15 and May 20 of a given year, except as specified in writing by the Owner. Seed shall be drilled at a depth of 1/2 inch utilizing a pasture or rangeland type drill (including custom seeders, furrow drills, disc drills or no-till drills) with a roller/cultipacker integral to the seed drill equipment. Broadcast seeding method will not be utilized on this project. Hydraulic seeding will be allowed only on areas too steep for drill seeding. Where the hydraulic seeding method is used, the application rates listed below must be doubled at no additional cost to the Owner.

DISTURBED AREAS DESIGNATED FOR RETURN TO AGRICULTURAL PRODUCTION

Common Name	Scientific Name	Variety	Seed Application Rate (PLS lbs/acre)[1]
Regreen	Triticum x Elytrigia	---	30
Total seeded species (PLS lbs/acre)[1]			30

[1] PLS (Pure Live Seed) seeding rate is based on drill seed application. PLS seeding rate will be doubled for broadcast or hydroseeded applications.

DISTURBED AREAS NOT DESIGNATED FOR RETURN TO AGRICULTURAL PRODUCTION

Common Name	Scientific Name	Variety	Seed Application Rate (PLS lbs/acre)[1]
Streambank wheatgrass	Agropyron riparium	Sodar	2
Pubescent wheatgrass	Agropyron dasystachyum	Critana	2
Western wheatgrass	Agropyron smithii	Rosana	3
Bluebunch wheatgrass	Agropyron spicatum	Secar	3
Crested wheatgrass	Agropyron cristatum	Ephraim	2
Sideoats grama	Bouteloua curtipendula	Pierre	3
Regreen	Triticum x Elytrigia	---	10
Cicer milkvetch	Astragalus cicer	---	5
Total seeded species (PLS lbs/acre)[1]			30

[1] PLS (Pure Live Seed) seeding rate is based on drill seed application. PLS seeding rate will be doubled for broadcast or hydroseeded applications.

(4) Tracking. Tracking will be required only on areas where mulch tilling cannot be accomplished.

(5) Mulching. Within 24 hours of seeding, a straw mulch will be applied to seeded areas. The straw mulch material shall be clean, pliable grain straw, at least 10 inches long, shall be free of noxious weeds and shall not contain greater than five percent cereal seed by weight. Chopped or ground material is not acceptable. The mulch material will not be acceptable if it is musty, moldy, or rotted. It shall be free of stones, dirt, roots, stumps, or other foreign material.

A grass hay or straw mulch will be applied uniformly by a mulch spreader at a rate of 4,000 pounds per acre in accordance with Standard Specification 610 in those areas which are to be seeded with the Grass Mix. After spreading, the mulch will be anchored with a mulch tiller (crimper), 3 to 6 inches into the soil. Crimping shall be oriented perpendicular to direction of prevailing for slopes steeper than 3:1, hydromulch shall be applied.

D. Tackifier. Tackifier shall be applied with all hydromulched areas at the manufacturer's recommended rate of forty (40) pounds per acre for slopes flatter than 2:1 and eighty (80) pounds per acre for slopes 2:1 or steeper.

(6) Summer Erosion Control Procedure. In the event the construction is completed after April 30 but before October 15, topsoil shall be uniformly spread over the disturbed areas. The topsoiled areas shall then be either mulched immediately with a vegetative mulch of straw or hay, applied at a rate of 4,000 pounds per acre or a soil stabilizer applied at the manufacturer's recommendation with a hydroseeder. The mulch shall be anchored into the seedbed as specified in Standard Specification 610.

A "no-till" drill with "no-till" coulters may be used to seed and fertilize directly into the mulched areas requiring permanent seeding after the October 15 date. After October 15, fertilizer shall be applied to the work areas at the application rate noted and incorporated into the soil as specified in Standard Specification 610. Seed shall then be applied by drilling methods only.

DIVISION 200 - EARTHWORK

203 - EXCAVATION AND EMBANKMENT:

Add the following subsections to this section.

203.06 DESCRIPTION OF CAMU PROJECT EARTHWORK

This specification covers the requirements for labor, supervision, equipment and materials associated with the earthwork operations shown on or implied by the design Drawings, or herein specified. Earthwork activities shall include, but not be limited to project layout, soil testing, site drainage, dust control, clearing, disposal, excavation, subgrade preparation, protection and removal of known underground utilities, fill and backfill, embankments, finish grading and site restoration.

203.07 CONSTRUCTION REQUIREMENTS OF CAMU PROJECT EARTHWORK

203.07.1 Grade Control and Layout of Work

The Contractor shall furnish all stakes, markers, tools, equipment and labor required to lay out the work from bench marks and/or control point markers indicated on the drawings. The Contractor shall not disturb existing survey monuments or bench marks without the consent of the Engineer. Markers that are accidentally disturbed by earthwork operations shall be replaced at the Contractor's expense by a licensed land surveyor. Copies of all survey notes will be given to the Engineer within one day after survey is conducted. Restaking and remarking of layout stakes caused by misinterpretation of the specifications will be at the Contractor's expense. It is recommended that the surveyor meet with the Engineer to review grades and dimensions, prior to commencing layout surveys. During construction of the compacted clay liner, the Contractor must provide a system for tracking stakes used for layout to ensure that none are lost within the compacted clay layer.

203.07.2 Inspection and Testing

The Owner may employ an independent laboratory for inspection and testing. The Owner will coordinate this testing with the Contractor, and the Contractor shall cooperate with the laboratory. The Owner will pay for these services. However, if initial testing indicates that the Contractor has not complied with the Contract Documents, then the costs of subsequent testing associated with the non-compliance will be deducted from the Contract price. Testing will include but not be limited to the tests listed in Tables 1, 203-1 and 203-2.

203.07.3 Protection and Safety

A. **Open Excavations.** Provide barricades and/or other safety equipment as required to protect any equipment, vehicles and workers from any open excavation.

TABLE 203- 1. TESTING OF SOIL PRIOR TO COMPACTION (Revised by Addendum 1, Item 5)

Parameter	Test Method	Minimum Frequency[1]	Test Rejection Criteria
Soil Content	Visual	Continuous	Reject all material with particles larger than allowed, unmixed material or other deleterious materials.
Scarification	Visual	Continuous	Scarification depth less than specification.
Moisture Density Curve	AASHTO T99 Method (ASTM D 698)	1 per 5000 cy	NA
Construction Stakes	Inventory	End of each construction day	Days work may be rejected if any stakes or portions of stakes are missing.

NOTES

(1) Additional tests may be required by the inspector in response to charges in material, or other problems noted by the inspector.

TABLE 203 – 2. TESTING OF SOIL AFTER COMPACTION (Revised by Addendum 2, Item 2)

Parameter	Test Method	Minimum Frequency [2]	Test Rejection Criteria [3]
Number of Passes, Equipment Type & Weight [1]	Visual	1 per acre per lift	Number of passes must exceed minimum determined in test pad analysis with similar equipment type and weight.
In-Situ Nuclear Density	ASTM D 2922	5 per acre/lift	No more than 20% outliers with no dry densities less than 6 pounds per cubic foot below required value.
In-Situ Sand Cone Density	ASTM D 1556	1 per every 20 tests	See Note 4
Oven Water Content	ASTM D 2216	1 per 500 cy	No more than 20% outliers. No water content less than 2% or more than 3% of allowable value.
Hydraulic Conductivity	ASTM D 5084 (remolded)	1 per 3,500 cy (1 per acre)	No more than 5% samples with permeability greater than 5×10^{-7} cm/sec.

NOTES

(1) Equipment and weight of compactors must be similar to or have similar compactive effort to those used in test pad analysis.
(2) Additional tests may be necessary depending on site conditions as determined by the inspector.
(3) Outliers may not be concentrated in one area or lift.
(4) Use to corroborate Density Tests.

B. **Protection of Property.** The Contractor shall protect adjacent property and avoid damage to such property. Adjacent property damaged due to the Contractor's operations shall be repaired or replaced. The repairs and/or replacement shall be equal to existing improvements and shall match existing finish and dimensions.

C. **Utilities.** The Contractor is responsible for obtaining utility locations as required by law. He will notify the Engineer prior to digging adjacent to utilities.

203.07.4 Subgrade and Fill Protection

During construction, fills and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained in such a manner as to drain effectively at all times.

Finished subgrade shall not be disturbed by traffic or other operations and shall be protected and maintained by the Contractor until completion and acceptance of the work. The storage or stockpiling of materials on the finished subgrade will not be permitted.

203.07.5 Site Drainage

Excavation, fill and backfill work areas shall be continually and effectively drained. Water shall not be permitted to accumulate in excavations or foundation areas. The Contractor shall construct suitable dikes, drains or provide pumping equipment, as required, to divert water flows away from the work areas.

203.07.6 Dust Control and Haul Road Maintenance

Control all dust produced from the project site. Prevent the spread of dust and avoid creation of a nuisance in the surrounding area. The Contractor shall prepare and submit a Dust Control Plan to the Owner for approval 30 days before construction begins. The Dust Control Plan will address methods to be used to minimize dust during sodding, hauling waste placement, grading and earthwork operations. It will also describe haul road sweeping and maintenance operations.

203.07.7 Excavation

A. **General Requirements.** The Contractor shall excavate every type of material encountered within the limits of the project, to the lines, grades and elevations indicated and as specified herein. Test pit and boring logs for the CAMU site are available from the Engineer.

B. Excavations For Cell Construction

1. The excavation shall be carried down to the elevations shown on the design Drawings. If suitable material in the bottom of the excavation is removed for the Contractor's convenience, the subgrade shall be restored by the Contractor and at his expense, to a condition at least equal to the undisturbed foundation as determined by the Engineer.

2. The Contractor shall remove any surface layer of unsuitable material at the planned grade of the excavation, as determined by the Engineer, from the site. The cost thereof will be measured as part of the excavation for payment, in accordance with subsection 109, Measurement and Payment.

C. Excavations for Ditches and Drainage Structures. Excavations for ditches and drainage structures shall be accomplished by cutting accurately the line, grade and cross-section required. Trenches and pits shall be of sufficient size to accommodate the installation of piping and structures. Excessive open ditch excavation shall be backfilled with satisfactory materials to the grades shown on the design Drawings. The Contractor shall maintain all excavations free from detrimental quantities of brush, sticks, trash and other debris.

D. Soil Salvage

1. The Contractor shall stockpile the top 8 inches of excavated soil for use as topsoil in the landfill cap.

2. The Contractor shall stockpile the next 16 inches of soil for use as subsoil in the landfill cap.

3. The remainder of excavated clayey sand clay, and silt (sandy loam) material from the landfill cell excavation shall be stockpiled for use in construction of the compacted clay liner and compacted clay cover. Clay rich soils will be segregated and stockpiled separately from sandier soils. The Engineer will determine material types. Determination limits to be concurred by Contractor.

4. Stockpiles shall be covered or provided with runoff containment in accordance with best management practices for preventing storm water pollution.

E. Subgrade Preparations

1. **General Requirements.** Subgrade shall be shaped to the line, grade and cross-section and compacted as specified for all required embankments and in the CAMU cell. This operation shall include

plowing, disking and any moistening or aeration required to obtain proper compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory material as directed by the Engineer.

Low areas resulting from the removal of unsatisfactory material shall be brought up to the required grade with satisfactory materials, and the entire subgrade shall be shaped to the line, grade and cross-section and compacted as specified.

After rolling, the elevation of the finished subgrade shall not vary more than 0.2 foot from the established grade and approved cross-section.

2. **Compaction.** Compaction shall be accomplished by sheepsfoot rollers to at least 90 percent of Proctor maximum dry density.

203.07.8 Embankment

A. Materials

1. **Compacted Clay Liner, Compacted Cover and Compacted Clay Cap and Cover Soil.** The compacted clay liner compacted clay cover shall consist of clay-rich sandy loam material from excavation required for the landfill cell. Cobbles and rock fragments having maximum dimensions of more than 2 inches shall not be used in these liners. Should cobbles and rock fragments of such size be found in otherwise approved earth fill materials, they shall be removed by the Contractor before the materials in the earth fill are rolled and compacted. No brush, roots, sod, or other perishable or unsuitable materials shall be placed in the clay liner or earth cap. Clay-rich soils will be used for the compacted clay liner and compacted clay cap. Soils with less clay content will be used for the cover soil and the compacted cap at the former southwest stockpile area.

2. **Drainage Layer and Gas Migration Layer.** The drainage layer and gas migration layer shall consist of well graded sand and gravel that is uncrushed, sub-rounded to rounded, screened and washed, free of vegetable matter, clays, and other deleterious substances that could, in time, change the hydraulic conductivity of the drainage layer. The gradation of the drainage layer material shall lie within the range shown in Table 3.

3. **Topsoil and Subsoil.** The Contractor shall obtain topsoil and subsoil from soil salvage stockpiles, as described in section 203.07.7 (D)(1) and 203.07.7 (D)(2). Topsoil shall be free of trash, rocks, hard lumps

of soil, and stubble. Subsoil shall be free of sharp or jagged rocks, roots, and debris.

TABLE 3. GRADATIONS – FINE AGGREGATE FOR CONCRETE

Sieve Size	Percent Passing
3/8" (9.5 mm)	100
No. 4 (4.75 mm)	95-100
No. 8 (2.36 mm)	80-100
No. 16 (1.18 mm)	50-85
No. 30 (0.600 mm)	25-60
No. 50 (0.300 mm)	5-30
No. 100 (0.150 mm)	0-10
No. 200 (0.75 mm)	0-3

4. **Waste Materials To Be Placed in Landfill.** Approximately 113,000 cubic-yards of waste material shall come from the areas within Asarco's East Helena Plant area, shown on the Drawings. Table 4 indicates that approximately 113,000 cubic-yards of waste material will be transferred to the landfill from existing stockpiles.

   The following tables (Tables 4 and 5) summarize the estimated volume, location, and metal concentrations of the waste material.

5. **Culverts, Access Roads, Temporary Erosion Controls, Import Topsoil.** These items shall be constructed in accordance with Section 203.03.02.

B. Placement

1. **Compacted Clay Liner, Compacted Clay Cover, Compacted Clay and Cover Soil.** Compacted clay liner and compacted clay cover shall be shaped to the line, grade and cross-section and compacted as specified. This operation shall include placement of suitable clay material in lifts not to exceed 6 inches after compaction, disking and any moistening or aeration required to obtain proper compaction. Cobbles exceeding 2 inches in diameter and otherwise unsatisfactory material shall be removed and replaced with satisfactory material as directed by the Engineer.

   Following compaction of any lift or portion of a lift, the fill shall be covered with a plastic cover, anchored at its edges, to prevent drying of the layer from exposure or saturation of the layer from rainfall until the next lift is placed. Up-slope covers shall be overlapped on down-slope liners to allow water to run to the sump area without pooling on the compacted clay liner. If, in the opinion of the engineer, the prepared surface of any layer of earth fill is

too dry or smooth to bond properly with the layer of material to be placed thereon, it shall be moistened and/or worked with harrow, scarifier, or other suitable equipment, in an approved manner to a sufficient depth to provide a satisfactory bonding surface before the next succeeding layer of earth fill material is placed.

TABLE 4. WASTE MATERIALS – VOLUMES AND MAXIMUM PB/AS/CD CONCENTRATIONS

Stockpiles/Excavation	Volume (CY)	Pb (PPM)	As (PPM)	Cd (PPM)
Lower Lake Sediment	27,000	15,972	4,308	1,978
Between Lakes	17,000	18,571	3,824	
Lower Ore Storage Yard	24,000	116,403	29,426	
Shew Ridge Soils	35,000	12,800	2,900	480
Other	10,000			
	======			
Total	113,000			

If, in the opinion of the Engineer, the compacted surface of any layer of the earth fill in place is too wet for proper compaction of the layer of earth fill material to be placed thereon, it shall be removed; allowed to dry; or be worked with harrow, scarifier, or other suitable equipment to reduce the moisture content to the required amount; and then it shall be recompacted before the next succeeding layer of earth fill material is placed.

2. **Drainage Layer.** The Contractor shall place the drain layer in a single 12-inch lift, taking care to protect the underlying flexible membrane liner from damage due to equipment traffic and turning. A minimum of 6-inches of cover soil will be placed over the drain layer as soon as possible to provide additional protection to the flexible membrane liner.

   After finish rolling, the elevation of the finished liner shall not vary more than 0.2 feet from the established grade and approved cross-section.

3. **Gas Migration Layer.** The Contractor shall place the gas layer in a single 6-inch lift.

4. **Topsoil and Subsoil.** The Contractor shall place topsoil and subsoil to a depth of 2 feet over the landfill cap surface after all other operations are completed. Topsoil shall be placed to a minimum thickness of 6 inches and left with a rough surface texture, but without drainage pockets that could puddle water. The Contractor shall clean the entire area of all surface rubble

5. and debris and leave the site with a neat appearance prior to seeding. Use the segregated piles required in Section 203.07.7 for the source of this material.

6. **Waste Material.** The contractor shall provide a temporary 30-mil Polyvinyl Chloride (PVC) Liner for the waste material placed in the landfill cell and shall keep it covered during filling and until the compacted clay cover is installed. Special care must be taken to ensure that the waste is covered prior to significant occurrences of precipitation. In addition, the Contractor shall ensure that the waste is placed in a manner that will ensure that the water which falls on the temporary liner will drain to a sump without coming in contact with the waste material and without significant ponding of the water on the temporary liner. The water reaching the sump shall immediately be discharged to the storm water retention pond shown on the Drawings. Therefore, the storm water retention pond shall be constructed prior to placing waste material into the landfill cell. Any storm water coming in contact with the waste material shall not be removed by the Contractor but shall be allowed to soak into the waste.

TABLE 5. METALS CONCENTRATIONS IN WASTE MATERIALS

	AS	CD	CU	PB	ZN	SB	BA	HG	AG	pH
Lower Lake Sediment Stockpile										
Max.	4308	1978	2229	15972	6633	989	816	94	113	7.35
Min.	1185	544	767	3637	2772	250	610	5	34	6.50
Mean	2250	1030	1350	7583	4397	518	737	21	58	6.90
Stockpiles Between Lakes										
Max.	3824			18571						
Min.	608			4949						
Mean	1698			13579						
Lower Ore Storage Yard Stockpiles										
Max.	29426			116403						
Min.	63			163						
Mean	3252			20932						
Shew Ridge Soils										
Max.	2900	480		12800		2600	3.6			
Min.	310	100		610			440	1		
Mean	1654	296		4882			1954	1.3		

C. Compaction

1. **Compacted Clay Liner, Compacted Clay Cover, Compacted Clay Cap and Cover Soil.** Except for final preparation of the clay liners to receive the flexible membranes, compaction shall be accomplished by sheepsfoot rollers. The sheepsfoot roller shall have compaction feet of sufficient length to fully penetrate the lift thickness being placed and with heads of larger diameter than the shafts. A smooth drum roller shall be used to provide a smooth top surface of the clay liner once it is ready to receive the flexible membrane liner. The bottom clay liner in the landfill cell and the upper clay liner in the landfill cap shall be compacted to 95 percent of Proctor maximum dry density. The cover soil layer in the landfill cap shall be compacted to 90 percent Proctor maximum dry density. Compact the top 6 inches of the subgrade to 90 percent Proctor maximum dry density.

   a. **Moisture Control.** The standard optimum moisture content is defined as, "That moisture content which will result in a maximum dry unit weight of the soil when subjected to the ASTM D-698-70, Method A., Proctor Compaction Test." the maximum dry weight, in pounds per cubic foot, obtained by the above procedure is the Proctor maximum dry density.

      The moisture content of the clay liner material prior to and during compaction shall be distributed uniformly throughout each layer of the material. The allowable ranges of placement moisture content are based on design considerations. The moisture control shall be such that the moisture content of compacted earth fill, as determined by tests performed by the Engineer, shall be within the following limits:

      Material represented by the samples tested having a placement moisture content more than 2 percent dry of the standard optimum condition, or more than 5 percent wet of the standard optimum condition will be rejected and shall be removed or reworked until the moisture content is between these limits.

      Within the above limits, and based on a continuous record of tests made by the Engineer on previously placed and accepted material, the uniformity of placement moisture content shall be such that:

      No more than 20 percent of the samples of accepted liner material will be drier than the standard optimum moisture content, and no more than 20 percent will be wetter than 3 percent wet of the standard optimum moisture content.

The average moisture content of all accepted embankment material shall be between 0 and 3 percent wet of the standard optimum moisture content.

The Engineer will inform the Contractor when the placement moisture content is near or exceeds the limits of uniformity specified above, and the Contractor shall immediately make adjustments in procedures as necessary to maintain the moisture content within the specified limits.

b. **Density Control.** Density control of compacted earth fill shall be such that the dry density of the compacted material, as determined by tests performed by the Engineer shall conform to the following limits:

1) **Compacted Clay Liner.** Material represented by samples having a dry density more than 6 pounds-per-cubic-foot less than the 90 percent of its Proctor maximum dry density will be rejected. Such rejected material shall be rolled until a dry density equal to or greater than 95 percent of its Proctor maximum dry density is obtained.

Within the above limit and based on a continuous record of tests made by the Engineer on previously placed and accepted embankment, the uniformity of dry density shall such that:

No more than 20 percent of the material represented by the samples tested shall be at dry density less than 95 percent of Proctor maximum dry density.

The average dry density of all accepted embankment material shall be not less than 95 percent of the average Proctor maximum dry density.

2) **Compacted Cover Soil.** Material represented by samples having a dry density less than 85 percent of its Proctor maximum dry density will be rejected. Such rejected material shall be rolled until a dry density equal to or greater than 90 percent of its Proctor maximum dry density is obtained.

Within the above limit and based on a continuous record of tests made by the Engineer on previously placed and accepted embankment, the uniformity of dry density shall be such that:

No more than 20 percent of the material represented by the samples tested shall be at dry density less than 90 percent of Proctor maximum dry density.

The average dry density of all accepted embankment material shall be not less than 90 percent of the average Proctor maximum dry density.

The Engineer will inform the Contractor when the dry density is near or exceeds the limits of uniformity specified above, and the Contractor shall immediately make adjustments in procedures as necessary to maintain the dry density within the specified limits.

2. **Drain Layer.** The Contractor shall not compact the drain layer, but shall lightly roll the layer to ensure its stability under equipment traffic. Carefully roll the layer under the guidance of the Engineer to ensure that the underlying flexible membrane liner is not damaged.

3. **Gas Migration Layer.** The Contractor shall not compact the gas migration layer but shall lightly roll the layer to ensure its stability under equipment traffic.

4. **Subsoil.** The Contractor shall lightly roll the subsoil to ensure its stability under equipment traffic.

5. **Waste Materials.** The Contractor shall compact waste soils with a minimum of eight (8) passes (4 cycles) of a sheepsfoot or padfoot roller. Place the waste soils in a maximum lift thickness of 2 feet. The initial lifts or any lifts placed directly on or beneath a liner shall be no less than 2 feet in thickness and shall be composed of waste material from the Lower Lake Sediment Pile. This waste cover material shall be approved by the Engineer. No waste material containing sharp, jagged rocks, concrete, roots debris, or any other material, which may puncture the HDPE-FML will be used in this protective layer. The final lift will be approximately a 1.5 foot layer from the Lower Lake Sediment Pile.

   The Contractor may choose the equipment and manner with which to place the waste cover material on the liner. However, it must be satisfactorily demonstrated to the Engineer that both the equipment and manner used to place the chosen waste cover material over the liner will not have any detrimental effect on the liner.

D. Finish Grading

The surface of all excavation, fill, embankment and subgrade shall be finished to a reasonable smooth and compact surface in accordance with the lines, grades and cross-sections shown. The degree of finish for all graded areas shall be within 0.2 foot of the grades and elevations indicated. Gutters and ditches shall be finished in manner that will result in effective drainage.

203.08 MEASUREMENT AND PAYMENT

Measurement, for payment, of the various items of embankment construction will be made of the material in place in the completed embankment to the line, grade, slope, and thickness shown on the Drawings. The cross-sections obtained by surveys made after completion of excavation for the landfill cell foundation will be used in computing the quantity of excavation and fill material. No allowance will be made in measurement for payment for settlement, shrinkage, and consolidation of the foundation or of the material in the landfill embankment and fill. In measuring excavation and fill for payment, the volume of structures, of specially compacted earth fill, and of other work for which items for payment are provided in the schedule, will be deducted.

Payment under all items of fill construction shall include the costs of preparing the underlying surface; of transporting the fill; of placing; of supplementary wetting of the fill, if necessary, and any additional work required on the fill to accomplish uniform moisture application; of compacting where compaction is required; of preparing bonding surfaces; and all other operations required to secure adequate bond between material in place and fill to be placed.

Payment for the fill items will be in addition to payment made for excavation of the materials.

It may be feasible to transport some of excavation material directly to the fill site at the time of constructing a liner, but the Contractor shall be entitled to no additional compensation above the unit prices Bid in the schedule by reason of it being necessary, or required by the contracting authority, that such excavated materials be deposited temporarily in stockpiles and handled prior to being placed as fill.

No measurement or payment will be made for the cost operations required to secure adequate bond between embankment in place and embankment to be placed.

SECTION 607 -FENCES

Add the following new subsection to this section:

607.06 PERMANENT SIGNS

607.06.01 Description

This work shall consist of supplying signs and attaching signs to metal or wooden posts. See the Special Provisions for further information.

607.06.02 Materials

A. SIGNS - The Contractor shall contract an appropriate manufacturer regularly engaged in the manufacture of signs. Signs will be manufactured from sheet aluminum meeting the requirements of Montana Department of Transportation, Standard Specifications for Road and Bridge Construction (1995 Edition), Section 704. Upon receiving signs, the Contractor shall take full responsibility for the safe handling, proper fastening, and protection of attached signs until final completion of the Contract.

When a wood post is specified, the Contractor shall furnish a new round wood post 8 inches in diameter with 6 inches gain or 6 inches square, sawed post either being 7 feet, 0 inches long meeting the following criteria:

1. Wood Posts and Blocks. Wood posts and blocks shall be Douglas Fir, Hemlock, Ponderosa Pine, Spruce, Larch, or Lodgepole Pine. Posts shall be straight, sound, and free from defects.

   Sawed posts prior to treating shall meet the requirements of construction grade posts and timber as set forth in the rules of the Western Wood Products Association or other equivalent grading rules, all of which shall meet the requirements of ASTM D 245.

   The surface of the posts shall vary not more than 1 inch from a straight line connecting the ends. The posts shall be seasoned to the extent that the remaining moisture content will not interfere with the prescribed treatment. The end of the post to be placed in the ground shall be treated a minimum of 36 inches with a minimum 5% by weight pentachlorophenol solution or Chromated Copper Arsenate (CCA), Type B or C, or Ammoniacal Copper Arsenate (ACA). The preservation must penetrate the wood at least 1/2 inch or full sap.

The post may be gained full-length, but the minimum length shall be the top half of the pole. The top of the post shall be chamfered or otherwise shaped to prevent pooling of water.

2. Steel Posts. When a metal post is specified, the post shall be 3 lb/ft minimum steel, "U" post, 8 feet, 0 inches long as follows:

   a. General. The size and shape, including any holes or cuts, shall conform to the applicable Standard Drawings and Special Provisions. When holes or cuts are made in steel posts in the field, the bared areas shall be given one coat of metal primer and two coat of aluminum paint. Galvanized posts shall be treated in accordance with ASTM A 123 (AASHTO M111).

607.06.03 Construction Requirements

A. WOOD POSTS - Wood posts may be either driven or emplaced in a hole augured or dug a minimum of 8 inches larger than the largest diameter of the post to be placed in it, to a depth of 2 feet, 6 inches. When the post is to be placed in an augured or dug hole, a 2 inches by 4 inches by 8 inches board shall be attached 8 inches from the bottom of the post. Attachment shall be made by driving 2 nails (16d) through the 2x4 and into the post. The 2x4 shall be treated according to the Standard Specifications. The material excavated from the hole shall be moistened to achieve compaction and shall be backfilled in 6 inch lifts. Each lift shall be solidly tamped and compacted. The wood post and sign shall be installed in accordance with Standard Drawing 570.01, Wooden Post Signing.

B. STEEL POSTS - Steel posts shall be emplaced in an augured or dug hole 11 inches or larger in diameter to a depth of 3 feet, 0 inches. The material excavated from the hole shall be moistened to achieve compacting and shall be backfilled in 6 inch lifts. Each lift shall be solidly tamped and compacted. The posts shall remain solidly in place after backfilling or driving is completed. When rocky ground is encountered, a rock drill shall be used to drill a hole 3 1/2 inches in diameter or larger, 3 feet, 0 inches in depth, filled with grout and the steel post emplaced to the standard depth. The steel post and sign shall be installed in accordance with details shown on the Drawings.

C. SIGN ATTACHMENT - The Contractor shall securely fasten signs to the wooden or steel posts at the locations shown on the Drawings or staked in the field by the Engineer. The required 3/8 inch head bolts, oversized plant washers, flat washers, lock washers, and hex nuts shall be furnished by the Contractor and shall meet the following specifications:

1. Hardware. Bolts, washers, nuts, lock washers, and incidental hardware and angles used for erecting aluminum sheet or steel signs shall be galvanized steel, galvanized in accordance with ASTM A 153 or A 163; or cadmium-plated steel plated in accordance with ASTM A 165. The means of attachment shall be as shown on the Standard Drawings.

The mounted bolts for all ground-mounted sign faces shall have the threads jammed in order to discourage sign theft. The thread jamming shall be accomplished after each sign installation is completed and any adjustments in the position of the sign have been made.

Other means of damage to bolt ends to prevent sign theft may be permitted at the direction of the Owner or Engineer.

An acceptable oversize plate washer may be fabricated from 3 1/2 inches wide by 3/16 inch thick mild steel flat bar cut 3 1/2 inches long drilled with a 3/8 inch hole through the center and painted with one coat of primer and two coats of aluminum paint.

SECTION 623 - FLEXIBLE MEMBRANE LINER

Add the following new section:

623.01 DESCRIPTION

A. Scope.

The work covered by these Specifications consists of furnishing and installing high-density polyethylene (HDPE) geomembrane where shown on the Drawings or directed by the Engineer.

B. Definitions used in this section.

1. Air Lance. Consists of a stream of air forced through a 3/32" air nozzle at the end of a hollow metal tube for conducting a commonly used nondestructive test method to determine seam continuity and tightness of relatively thin, flexible geomembrane.

2. Bodied Chemical Fusion Agent. A chemical fluid containing a portion of the parent geomembrane that, after application of pressure and after the passage of time, results in the chemical fusion of two essentially similar geomembrane sheets, leaving behind only that portion of the parent material.

3. Geomembrane. An essentially impermeable synthetic membrane used as a solid or liquid barrier. Synonymous term for flexible membrane liner (FML).

4. Seaming Boards. Smooth wooden boards, conveyor belt, or similar hard surface (preferably 1" X 12" X 8', or more), placed beneath the area to be seamed to provide a uniform surface to apply roller pressure in the fabrication of field seams.

5. Tensiometer. A device containing a set of opposing grips used to place a geomembrane seam in tension for evaluating its strength in shear or in peel.

6. Vacuum Box Assembly. Consists of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole, or valve assembly, and a vacuum gauge for conducting a nondestructive test method which develops a vacuum in a localized region of a geomembrane seam in order to evaluate the seam's tightness and suitability.

623.02 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications

1. The installer shall have worked in a similar capacity on at least five (5) projects similar in complexity to the project described in the Contract Documents and with each project involving at least 100,000 square feet of a similar product.

2. Installation supervisor/field engineer shall have worked in a similar capacity on at least two (2) jobs similar in size and complexity to the project described in the Contract Documents.

3. The manufacturer shall perform the quality control tests listed in Table 4 at the manufacturing plant. Provide all quality control certificate to the Engineer as specified in Section 623.03(B) of these Special Provisions.

TABLE 4. GEOMEMBRANE SPECIFICATIONS

PROPERTY	TEST METHOD	REQUIREMENT	
		CELL	CAP
Gauge (mils nominal)	ASTM D-1593	60	40.0
Tear Strength (pounds)	ASTM D 1004	45	30
Tensile Strength	ASTM D 638		
1. Yield Stress (lb/in)	Type IV	130	84
2. Break Stess (lb/in)		240	160
3. Yield Elongation (%)		13	13
4. Break Elongation (%)		560	500
Puncture Resistance (pounds)	ASTM D 4833	80	52
Stress Crack Resistance (Hours)	ASTM D 5397 Appendix	200	200

B. Delivery, Storage and Handling

1. Deliver geomembrane to the site only after the Engineer receives and approves the required submittals. Immediately remove damaged or unacceptable material from the site and replaced at no cost to the Owner.

2. Store geomembrane on pallets to protect from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, direct heat of the sun or other damage. Stack geomembrane no more than 3 rolls or 1 pallet high.

3. Repair all geomembrane damaged during handling to the satisfaction of the Engineer. Immediately remove from the site and replace geomembrane determined by the Engineer to be irreparably damaged. Repair, removal and replacement shall be solely at the Contractor's expense.

C. Warranty

1. The geomembrane installer shall warrant his workmanship to be free of defects for one (1) year after final acceptance of the work. This warranty shall include, but not be limited to, all seams, anchor trenches, geomembrane attachments to appurtenances, and penetration seals. The installer shall also obtain and furnish the Owner a material warranty from the geomembrane manufacturer. The material warranty shall be for defects or failure due to weathering for ten (10) years after final acceptance.

2. Should a defect or failure occur within the aforesaid periods, the installer shall bear all costs for repair and/or replacement of the geomembrane and shall in addition bear all costs for the excavation of any cover backfill that is required to be removed in order to repair and/or replace the geomembrane. All materials removed to allow repairs to be made shall be reinstalled by the installer in accordance with these Contract Documents.

623.03 SUBMITTALS

A. Submit the following documents to the Engineer no later than three (3) weeks prior to installation of the geomembrane:

1. Complete written instructions for storage, handling, installation and seaming of the geomembrane which are in compliance with the Specifications and conditions of warranty.

2. Panel layout drawings showing both fabricated and field seams, and details not conforming with the Drawings (if any).

3. Qualification of the geomembrane installer, including the resume of the field engineer installation supervisor to be assigned to this project, including dates and duration of employment.

4. Installer's Quality Control Manual.

B. Submit the following documents to the Engineer prior to the shipment of the geomembrane to the site.

1. Polymer compound data

a) Statement of production date or dates.
b) Laboratory certification that the materials meet Specifications.
c) Certification that all materials are from the same manufacturer.
d) Copy of quality control certificates issued by manufacturer.
e) Statement that no reclaimed polymer is added to the compound.

2. Geomembrane data.

a) Statement of production date or dates
b) Laboratory certification that the materials meet the Specification.
c) Copy of quality control certificates issued by the manufacturer.
d) Reports of tests defined in Table 4 from the manufacturer.

C. Submit the following to the Engineer prior to start of the geomembrane installation:

1. Warranties for material and installation as specified hereinafter for review to the Owner.

2. Certificate of acceptance of prepared subgrade for each area to be covered by geomembrane, signed by the installation supervisor.

D. During installation, submit to the Engineer results of Contractor quality control testing as specified in 623.06 TESTING.

E. Upon completion of the installation, submit to the Engineer the following:

(1) Certificate stating the geomembrane has been installed in accordance with the Contract Documents.
(2) Manufacturer's and Installer's warranties as specified hereinafter.
(3) Record drawings showing location of panels, seams, repairs, patches, and destructive samples, including detailed measurements.

623.04 MATERIALS

A. Description of Materials

1. Geomembrane liner shall be top quality products, recommended by the manufacturer for this specific type of work, and shall have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

2. Extrudate Rod or Bead shall be made from the same resin as the geomembrane liner with carbon black. Additives shall be thoroughly dispersed in the extrudate.

C. Physical Characteristics

The geomembrane liner:

1. Shall be formulated from a high density polyethylene resin with a specific gravity greater than or equal to 0.94. All resins shall be of the same type and no batch shall be blended with recycles or seconds.

2. Shall be uniform in color, thickness, size and surface texture. The material shall be a flexible, durable, watertight product free of pinholes, blisters, holes, bubbles, gels, undispersed resins or carbon black, and other contaminants. Processing aides, antioxidants and other additives shall not exceed a combined maximum total of 1 percent by weight, ignoring carbon black, and 3.5 percent by weight including carbon black.

3. Shall have the minimum physical property characteristics, as outlined in Table 4. Certified test results showing that the sheeting meets or exceeds the Specification shall be submitted per Section 623.03.

4. Shall be supplied in rolls labeled with thickness, length, width, manufacturer, plant location, and identification number.

623.05 INSTALLATION

A. Subgrade Preparation

The subgrade to be lined:

1. Shall be maintained in a dry enough condition for equipment to operate without rutting.

2. Shall be smooth and free of projections and sharp objects that can damage the lining. Remove all stumps and roots. Remove rocks, hard clods, and other such material, and roll the subgrade so as to provide a smooth compact surface. The smoothed subgrade will limit liner bridging to less than 1 inch.

3. Shall be inspected prior to geomembrane installation to ascertain its suitability for installation in compliance with the terms of the product warranty and the requirements of this Specification. Submit to the Engineer a signed certification that the prepared subgrade surface is satisfactory. Installation of geomembrane without providing written certification shall constitute acceptance of the subgrade by the Contractor.

4. Shall have round edges at anchor trenches or edges shall be cushioned with geotextile and backfill.

B. **Geomembrane Installation**

1. Only layout the amount of geomembrane that can be seamed during that same day. Assign each panel a simple and logical identifying code number or letter. Identify the panels with each appropriate code on the layout design referenced in 623.03 A.2.

2. Do not damage geomembrane by handling, traffic, or leakage of hydrocarbons or any other means. Do not wear damaging shoes or engage in activities that could damage the geomembrane. Open or unroll geomembrane panels using methods that will not damage, stretch or crimp the geomembrane. Prevent excess condensation on the geomembrane such that the underlying surface is not adversely impacted. Protect underlying surface from damage. Provide sufficient material to allow for geomembrane shrinkage and contraction. Use methods that minimize wrinkles between adjacent panels. Place ballast on geomembrane to prevent uplift from wind. Use ballast that will not damage geomembrane. Do not allow vehicle traffic directly on geomembrane. Remove folded or wrinkled material that exceeds 6 inches in width. Visually inspect geomembrane for imperfections. Mark faulty or suspect areas for testing and/or repair. Any portion of the lining damaged during installation shall be removed or repaired by using an additional piece of the same membrane as specified herein. The liner shall be installed in a relaxed condition and shall be free of stress or tension upon completion of the installation. Stretching the liner to fit is not permissible. Backfill anchor trenches as soon as possible after installation of liner and geonet, if applicable.

3. Place and seam geomembrane only when ambient temperatures, measured six inches above the geomembrane, are between 40 degrees F and 100 degrees F, unless otherwise specified or approved. Installation below 40 degrees F shall occur only after verifying that the geomembrane can be seamed according to Specifications and approval by the Engineer. Do not install geomembrane during precipitation, in the presence of excessive moisture, in areas of ponded water, or in the presence of excessive winds. Protect the geomembrane from wind uplift during installation through the use of sand bags or other suitable weights.

4. Repair all damaged geomembrane and test damaged areas prior to backfilling.

C. **Pipe Boots. Fit and seal** pipes, manholes, and other penetrations of the geomembrane with shop fabricated boots as shown on the Drawings. Match the flange portion of the boot to the angle of the slope or bottom where the pipe or manhole enters the liner for a smooth fit without excess stretching of the material.

D. **Seaming**

1. Seam Layout shall:

   a) Orient seams parallel to line of maximum slope, i.e., orient down, not across, slope.
   b) Keep butt seams at least ten (10) feet horizontally away from toe of slope.
   c) Use seam numbering system compatible with panel numbering system.

2. Trial field seaming shall be accomplished by the Contractor on-site.

   a) Conduct trial seams on pieces of geomembrane to verify adequate seaming methods and conditions.

   b) Conduct trial seams:

   c)
      1) at beginning of each seaming period
      2) at least once for each four seaming hours
      3) For each seaming apparatus in use
      4) At least once per shift for each person performing seaming
      5) Whenever changes in climatic conditions could effect seam quality.

   d) Make test seam in the location of seaming and in contact with subgrade or geosynthetic (same condition as the geomembrane to be seamed.)

   e) Make test seam sample at least two (2) feet long and eleven (11) inches wide with the seam centered lengthwise.

   f) Cut two, 1-inch wide test strips from opposite ends of the trial seams.

   g) Cut specimens constant 1-inch wide and clamp at 90 degree angle in tensiometer.

   h) Quantitatively test field specimens for peel adhesion (ASTM D3083) first, and bonded seam strength (ASTM 3083) second. Insure that these tests are performed in this order.

   i) A trial seam sample passes when the following results are achieved for both tests.

      1) the break is film tearing bond (FTB)

      2) the break is ductile

3) the strength of break is at least 80% of the specified sheet strength

j) Repeat the trial seam in its entirety if one (1) of the trial seam samples fails in either peel or shear mode.

k) Notify Engineer when repeated trial seam fails and do not continue seaming until deficiencies or adverse conditions are determined and corrected, and two (2) consecutive successful trial seams are achieved.

3. Use the following seaming procedure.

a) Do not begin seaming on liner until all trial seam test samples made by the equipment to be used passes tests as defined above.

b) Form seams per manufacturers written instructions. Wipe the contact surfaces of the panels clean to remove all dirt, dust or other substance. Use solvent for cleaning contact surfaces of field joints and for other required uses as recommended by the manufacturer. Apply a hot wedge or hot knife seaming tool to the overlapped panel edges creating a continuous thermal bond between the panels. Smooth out any wrinkles. Field seams shall have a strength of at least 80% of the specified sheet strength.

c) Extend seaming to the outside edge of panels to be placed under the anchor berm and in the anchor trench.

d) If there is not firm substrate, use a seaming board directly under the seam overlap to achieve proper support.

e) If seaming operations are carried out at night, provide adequate illumination.

f) Cut fish mouths or wrinkles at the seam overlaps along the ridge of the wrinkle in order to achieve a flat overlap. Seam the cut fish mouths or wrinkles and patch any portion where the overlap is less than three (3) inches with an oval or round patch of the same geomembrane extending a minimum of six (6) inches beyond the cut in all directions.

g) Seam only when ambient temperature, measured 6 inches above the geomembrane is between 40 degrees F and 100 degrees F unless other limits are accepted, in writing, by the Engineer.

E. Defects and Repairs

1. Inspection

   a) During installation and seaming, visually examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of the examination. Mark areas suspected of deficiencies. Remove areas of geomembrane requiring more than one patch per 5,000 square feet and replace at no additional cost to the Owner.

   b) Repair each suspect location both in seam and non-seam areas shall be repaired and non-destructively tested. Do not proceed with work which will cover locations which have been repaired until passing test results are achieved.

2. Repair Procedures

   a) Repair all portions of the geomembrane exhibiting a flaw, or failing a destructive or non-destructive test. Provide a written recommendation for method of repair to the Engineer prior to initiating repair and obtain approval of the repair procedure from the Engineer prior to making repair. Methods which are acceptable to the Engineer and their application are as follows:

      1. Capping. Cap for repair of large lengths of failed seams.

      2. Patching. Patch large (over 3/8 inch diameter) holes, tears (over 2 inches long), undispersed raw material, and contamination by foreign matter.

      3. Remove and Replace. Remove the unsatisfactory material and replace with new material seamed into place.

   b) In addition,:

      1. Abrade surfaces of the geomembrane which need repaired no more than one-half (1/2) hour prior to the repair.

      2. Clean and dry all surfaces at the time of repair.

      3. Extend patches or caps at least six (6) inches beyond the edge of the defect and all corners of patches shall be rounded with a radius of at least three (3) inches.

4. Cut the geomembrane below large caps to avoid water or gas collection between the sheets.

c) Nondestructively test each repair using the methods described in Section 623.06 of these Special Provisions. Repairs which pass the non-destructive test shall be considered an adequate repair. Large caps shall be of sufficient length to require destructive test sampling, at the discretion of the Engineer. Redo repairs that have failed tests and retest until a passing test results.

623.06 TESTING

A. General

1. Quality control testing, including laboratory testing, field seam testing, and destructive testing shall be performed by the Contractor and observed at the discretion by the Engineer.

2. Field seams shall be non-destructively tested over their full length by pressurizing the seam if a dual-hot-wedge method was used in seaming, or using a vacuum test unit or other approved methods. Non-destructive testing shall be carried out as the seaming progresses, not at the completion of all the field seaming.

B. Vacuum Testing

1. The equipment shall consist of the following:

a) A vacuum box assembly.

b) A steel vacuum tank and pump assembly equipped with a pressure control and pipe connections.

c) A rubber pressure/vacuum hose with fittings and connections.

d) A soapy solution and applicator.

2. The following procedures shall be followed:

a) Energize the vacuum pump and reduce the tank pressure to approximately ten (10) inches of water.

b) Place the box over the wetted seam area (soapy solution).

c) Ensure that a leak-tight seal is created.

d) For a period of not less than fifteen (15) seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.

e) All areas where soap bubbles appear shall be marked and repaired in accordance with repair procedures described in Section 623.05E.

f) Conduct vacuum testing per ASTM 4437.

C. Air Lance Testing

1. Equipment shall consist of an air lance that can provide a minimum air pressure of 30 psi and a maximum air pressure of 40 psi.

2. The following procedures shall be followed:

a) The air nozzle shall be held at a 45 degree angle to the field seam approximately 2" off the edge of the material.

b) The air shall be directed toward the seam edge, upper edge and surface to detect loose edges.

c) Riffles indicating unbonded areas within the seam or other undesirable seam conditions shall be patched in accordance with repair procedures described in Section 623.05 (E). The patch should then be tested using the same air lance test method.

d) Conduct air lance testing per ASTM 4437.

D. Destructive Testing

1. The Engineer will direct the Contractor to perform destructive seam tests at selected locations. The purpose of these tests is to evaluate seam strength. Perform seam strength testing as the seaming work progresses, not at the completion of all field seaming.

2 Location and Frequency

a) Collect destructive test samples shall be collected at a minimum frequency of one (1) test location per five hundred (500) feet of seam length, unless otherwise directed by the Engineer.

b) Samples, in addition to the minimum frequency, shall be taken as required by the Engineer.

c) Test location shall be determined during seaming and may be prompted by suspicion of insufficient adhesive, contamination, offsets, or any other potential cause of imperfect seaming. The Engineer will select the locations. The Engineer will not notify the Installer in advance of selecting locations where seam samples will be taken.

d) The Engineer reserves the right to increase the frequency in accordance with the actual performance results of samples taken.

3. Sampling Procedure

a) Samples shall be cut at locations designated by the Engineer as the seaming progresses in order to obtain laboratory test results before the geomembrane is covered by another material. Each sample shall be numbered and the sample number and location identified on the panel layout drawing.

b) All holes in the geomembrane resulting from destructive sampling shall be immediately repaired in accordance with repair procedures specified in Section 623.05 (E).

4. Size of Samples - The samples shall be eleven (11) inches wide by twenty-four (24) inches long with the seam centered lengthwise. Two (2) 1-inch wide strips shall be cut from each end of the sample and these shall be tested (shear and peel) in the field by the installer. The remaining sample shall be cut into two (2) parts and distributed as follows:

a) One (1) portion for the Contractor, eleven (11) inches by eleven (11) inches.

b) One (1) portion to the Engineer or archive storage, eleven (11) inches by eleven (11) inches

5. Field Testing - The two (2), one (1) inch wide strips described in Section 623.06 (D)(4) shall be tested in the field by the installer and witnessed by the Engineer, by tensiometer, for peel and shear, respectively. Test strips shall meet the peel and shear values specified for trial seams in Section 623.05 (D)(2). If any field test sample fails to pass, then the procedures outlined in that Section shall be applied.

6. Procedures for Destructive Test Failure - The following procedures shall apply whenever a sample fails the destructive test, whether performed by field or laboratory testing:

a) The seam shall be reconstructed between any two (2) passed test locations, or

b) The seaming path can be traced to an intermediate location (at least ten (10) feet minimum from the location of the failed test in each direction) and a small sample taken for an additional field test at each location. If these additional samples pass the field tests, then full laboratory samples shall be taken. If these laboratory samples pass, then the seam shall be reconstructed between these locations. If either sample fails, then the process shall be repeated to establish the zone in which the seam should be reconstructed.

7. Acceptance of Seams - All acceptable seams must be bounded by two (2) locations from which samples passing laboratory destructive tests have been taken. In cases exceeding one hundred and fifty (150) feet of reconstructed seam, a sample taken from within the reconstruction zone must pass destructive testing. Whenever a sample fails, additional testing may be required for seams that were seamed by the same personnel and/or apparatus or seamed during the same time shift.

E. Geomembrane Wrinkle. When seaming of a geomembrane liner is completed, or when seaming of a large area of a geomembrane liner is completed, and prior to placing overlying materials, the Engineer shall identify the location of excessive geomembrane wrinkles. Wrinkles so identified shall be cut, re-seamed and tested.

F. Seams That Cannot Be Non-Destructively Tested - The following procedures shall apply to locations where seams cannot be non-destructively tested:

a) All such seams shall be cap-stripped with the same geomembrane.

b) If the seam is accessible to testing equipment prior to final installation, the seam shall be non-destructively tested prior to final installation.

G. Engineering Observation. If the seam cannot be tested prior to final installation, the seaming and cap-stripping operations shall be observed by the Engineer and Contractor for uniformity and completeness.

H. Geomembrane Acceptance. The Contractor shall retain ownership and responsibility for the geomembrane until acceptance by the Owner. The geomembrane shall be accepted by the Owner when:

1) Conformance test results meet the requirements of the Contract Documents.

2) Required documentation including warranty from the manufacturer, fabricator and installer has been received and accepted.

3) The installation is complete and accepted by the Engineer.

4) Verification of the adequacy of all field seams and repairs, including associated testing, is complete.

5) Written certification documents, including as-built drawings, have been received by the Engineer.

623.07 MEASUREMENT AND PAYMENT

Measurement for payment of geomembrane construction will be made of the material in place in the completed liners to the line, grade, and slope shown on the Drawings. Surveys made prior to installation of each liner by the Engineer will be used in computing the quantity of geomembrane used. No allowance will be made in measurement for payment for waste, repairs, test samples or overlap.

Payment under all items of geomembrane construction shall include the costs of preparing the surface to receive the geomembrane and of furnishing, placing, seaming, testing, repairing, and anchoring the geomembrane.

SECTION 624 - GEONET

Add the following new section:

624.01.1 Description

The work covered by these Specifications consists of furnishing and installing polyethylene (PE), medium density polyethylene (MDPE), or high density polyethylene (HDPE) geonet where shown on the Drawings or directed by the Engineer.

624.02.1 Materials

The geonet drainage material shall contain stabilizers to prevent ultraviolet light degradation.

A. Description of Materials

1. Geonet shall be first quality products and manufactured specifically for the purposes of this work, and shall have been satisfactorily demonstrated by prior use to be suitable and durable for such purposes.

B. Physical Characteristics

1. Geonet shall be formulated from 100% virgin polyethylene resin. The use of water soluble formulation ingredients is prohibited.

2. Geonet shall be uniform in color, thickness, size and surface texture. The material shall be a flexible, durable product free of tears and contaminants.

3. Geomembrane shall have the minimum physical property characteristics, as outlined in Table 5. Certified test results showing that the sheeting meets or exceeds the Specification shall be submitted per Section 624.03 (E).

TABLE 5. GEONET SPECIFICATIONS

PROPERTY	TEST METHOD	MINIMUM REQUIREMENT
Thickness (mils nominal)	ASTM D-751	250.0
Compressive Strength (pounds/inch^2)	ASTM D 1621	100.0
Transmissivity @ 4000 psf (gal./min./ft.)	ASTM D 4716	2.4

624.03 INSTALLATION

A. Surface Preparation

1. Prior to deployment of the geonet, the Contractor shall inspect the underlying geomembrane surface to ascertain its suitability for installation in compliance with the terms of the product warranty and the requirements of this Specification.

2. Round edges of anchor trenches as recommended by the geonet manufacturer or cushion with geotextiles and backfill.

B. Geonet Installation

1. Only install enough panels that can be secured during that same day.

2. Do not damage geonet by handling, traffic, or leakage of hydrocarbons or any other means. Do not wear damaging shoes or engage in activities that could damage the geomembrane. Open or unroll geonet panels using methods that will not damage, stretch or crimp the geonet. Use methods that minimize wrinkles between adjacent panels. Place ballast on geonet to prevent uplift from wind. Use ballast that will not damage geonet. Repair damage to underlying materials prior to completing deployment of geonet. Do not allow vehicle traffic directly on geonet. Remove folded material. Visually inspect geonet for imperfections. Mark faulty or suspect areas for repair. Any portion of the geonet damaged during installation shall be removed or repaired by using an additional piece of the same geonet as specified herein. The geonet shall be installed in a relaxed condition and shall be free of stress or tension upon completion of the installation. Stretching the geonet to fit is not permissible. Backfill anchor trenches.

C. Securing Geonet

1. Seam Layout shall meet the following requirements:

2.

   a) Orient seams parallel to line of maximum slope, i.e., orient down, not across, slope.

3. The seaming procedure used shall be as follows:

   a) Field connections will be made to secure factory fabricated panels or rolls of geonet together in the field. Connections shall be formed by lapping the edges of panels a minimum of 2 inches. Any wrinkles shall be smoothed out.

b) Secure overlapped edges of the geonet by plastic ties approximately every five (5) feet along the panel length. Use plastic ties that are white or a bright color for easy inspection. Do not use metallic ties.

c) Extend connections to the outside edge of panels to be placed under the anchor berm and in the anchor trench.

d) If securing operations are carried out at night, provide adequate illumination.

D. Defects and Repairs

1. Inspection

a) During installation and securing, examine all areas of the geonet for defects, tears, undispersed raw materials and all sign of contamination by foreign matter. The surface of the geonet shall be clean at the time of the examination. Mark all areas suspected of deficiencies.

b) Repair each suspect location.

2. Repair Procedures

a) Repair all portions of the geonet exhibiting a flaw by removing the unsatisfactory material and replacing with new material that is overlapped and secured in place.

E. Geonet Acceptance. The Contractor shall retain ownership and responsibility for the geonet until acceptance by the Owner. The geonet shall be accepted by the Owner when:

1. Conformance test results meet the requirements of the Contract Documents.

2. Required documentation including warranty from the manufacturer, fabricator and installer has been received and accepted.

3. The installation is complete and accepted by the Engineer.

4. Written certification documents, including as-built drawings, have been received by the Engineer.

5. Submittals shall be the same as those required for geomembrane in Section 623.

624.04 MEASUREMENT AND PAYMENT

Measurement for payment of geonet construction will be made of the material in place to the line, grade, and slope shown on the Drawings. No allowance will be made in measurement for payment for waste, repairs, or overlap.

Payment under all items of geonet construction shall include the costs of furnishing, placing, joining, and anchoring the geonet.

END OF DOCUMENT

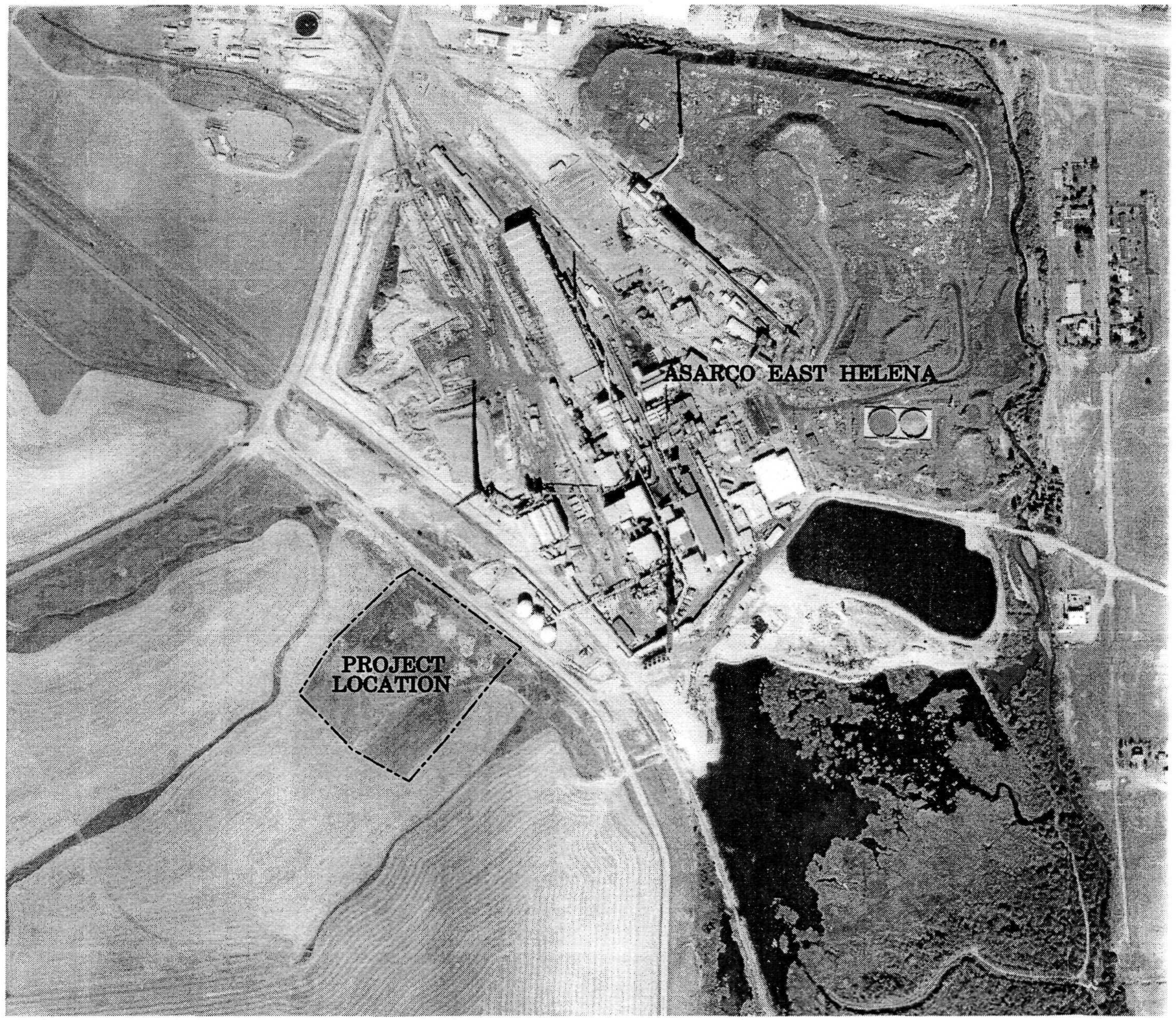
SECTION XII

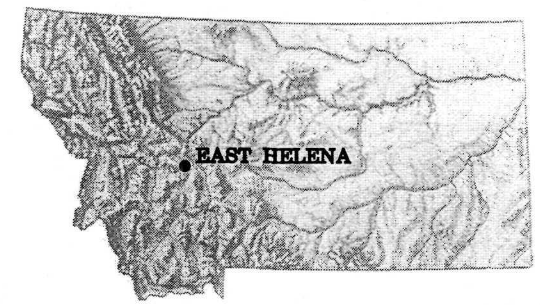
DRAWINGS

ASARCO INCORPORATED

EAST HELENA PLANT
CAMU (RCRA LANDFILL) - PHASE I CELL
PROJECT DRAWINGS

OCTOBER 2000





DRAWING LIST

SUPPLIED BY	DWG. NO.	TITLE
		CONSTRUCTION DRAWINGS
		GENERAL
Hydrometrics	08-1-9970	DRAWING INDEX & VICINITY MAP
Hydrometrics	08-1-9971	WASTE STOCKPILES AND HAUL ROUTES
		CIVIL
Hydrometrics	08-1-9972	CROSS SECTIONS
Hydrometrics	08-1-9973	EXCAVATION SITE PLAN AND EROSION CONTROL PLAN – EXCAVATION PHASE
Hydrometrics	08-1-9974	ACCESS ROAD SECTIONS AND DETAILS
Hydrometrics	08-1-9975	EROSION CONTROL PLAN – WASTE PLACEMENT PHASE
Hydrometrics	08-1-9976	LEACHATE DETECTION, COLLECTION, AND REMOVAL SYSTEM SECTIONS AND DETAILS
Hydrometrics	08-1-9977	PRIMARY AND SECONDARY SUMP DETAILS
Hydrometrics	08-1-9978	EROSION CONTROL PLAN – CAP CONSTRUCTION PHASE
Hydrometrics	08-1-9979	RUNOFF CONTROL POND PLAN AND RIPRAP SLOPE DRAIN DETAILS
Hydrometrics	08-1-9980	FINISHED GRADE PLAN WITH GAS VENT LOCATIONS AND DETAILS
Hydrometrics	08-1-9981	MISCELLANEOUS DETAILS
Hydrometrics	08-1-9982	RAILROAD CROSSING AND FENCE PENETRATION DETAILS AND SECTIONS
Hydrometrics	08-1-9983	SOUTHEAST LOWER LAKE AREA GRADING PLAN AND SECTIONS
Hydrometrics	08-1-9984	CONSTRUCTION LAYOUT PLAN

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES

DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

REFERENCES

DWG. NO.	TITLE

REVISIONS

NO.	BY	DATE	DESCRIPTION
10			
9			
8			
7			
6			

REVISIONS

NO.	BY	DATE	DESCRIPTION
5			
4			
3			
2			
1			

PRELIMINARY
REVISED–DESTROY PREVIOUS ISSUE
RELEASED FOR CONSTRUCTION
ISSUED BY
DATE

SCALE	AS NOTED	
DRAWN BY	0249	8/25/00
CHECKED BY	SMY	9/25/00
APPROVED	MJO	10/16/00

MONTANA MICHAEL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

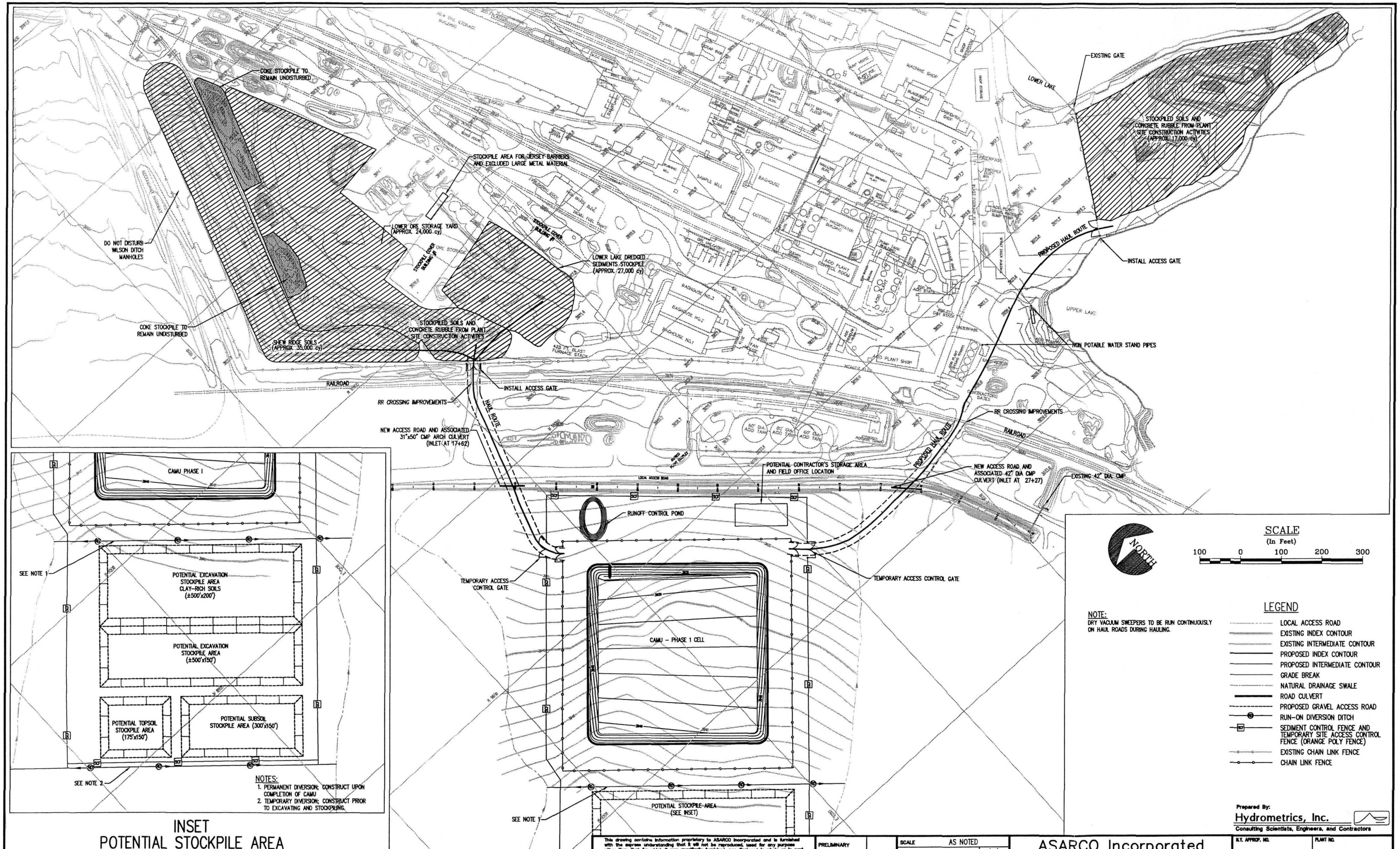
ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
DRAWING INDEX AND VICINITY MAP

N.Y. APPROP. NO.
PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9970
REV.: △

UPDATE TIME: 9:33AM
D07\ 0127\D65\D072\HEL\041601\Z:\Land Projects\1270b201\DWG\12708201H003.dwg


COKE STOCKPILE TO REMAIN UNDISTURBED
STOCKPILE AREA FOR JERSEY BARRIERS AND EXCLUDED LARGE METAL MATERIAL
EXISTING GATE
LOWER LAKE
STOCKPILED SOILS AND CONCRETE RUBBLE FROM PLANT SITE CONSTRUCTION ACTIVITIES (APPROX. 17,000 cy)
DO NOT DISTURB WILSON DITCH MANHOLES
LOWER ORE STORAGE YARD (APPROX. 24,000 cy)
LOWER LAKE DREDGED SEDIMENTS STOCKPILE (APPROX. 27,000 cy)
PROPOSED HAUL ROUTE
INSTALL ACCESS GATE
UPPER LAKE
COKE STOCKPILE TO REMAIN UNDISTURBED
STOCKPILED SOILS AND CONCRETE RUBBLE FROM PLANT SITE CONSTRUCTION ACTIVITIES
SHEW RIDGE SOILS (APPROX. 35,000 cy)
NON POTABLE WATER STAND PIPES
RAILROAD
INSTALL ACCESS GATE
RR CROSSING IMPROVEMENTS
HAUL ROUTE
RR CROSSING IMPROVEMENTS
NEW ACCESS ROAD AND ASSOCIATED 31"x50" CMP ARCH CULVERT (INLET AT 17+62)
POTENTIAL CONTRACTOR'S STORAGE AREA AND FIELD OFFICE LOCATION
NEW ACCESS ROAD AND ASSOCIATED 42" DIA CMP CULVERT (INLET AT 27+27)
EXISTING 42" DIA. CMP
LOCAL ACCESS ROAD
RUNOFF CONTROL POND
TEMPORARY ACCESS CONTROL GATE
TEMPORARY ACCESS CONTROL GATE
CAMU – PHASE 1 CELL
SEE NOTE 1
POTENTIAL STOCKPILE AREA (SEE INSET)
CAMU PHASE I
SEE NOTE 1
POTENTIAL EXCAVATION STOCKPILE AREA CLAY-RICH SOILS (±500'x200')
POTENTIAL EXCAVATION STOCKPILE AREA (±500'x150')
POTENTIAL TOPSOIL STOCKPILE AREA (175'x150')
POTENTIAL SUBSOIL STOCKPILE AREA (300'x150')
SEE NOTE 2
NOTES:
1. PERMANENT DIVERSION; CONSTRUCT UPON COMPLETION OF CAMU
2. TEMPORARY DIVERSION; CONSTRUCT PRIOR TO EXCAVATING AND STOCKPILING.
INSET
POTENTIAL STOCKPILE AREA
NORTH
SCALE
(In Feet)
100 0 100 200 300
NOTE:
DRY VACUUM SWEEPERS TO BE RUN CONTINUOUSLY ON HAUL ROADS DURING HAULING.
LEGEND
LOCAL ACCESS ROAD
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
PROPOSED INDEX CONTOUR
PROPOSED INTERMEDIATE CONTOUR
GRADE BREAK
NATURAL DRAINAGE SWALE
ROAD CULVERT
PROPOSED GRAVEL ACCESS ROAD
RUN–ON DIVERSION DITCH
SEDIMENT CONTROL FENCE AND TEMPORARY SITE ACCESS CONTROL FENCE (ORANGE POLY FENCE)
EXISTING CHAIN LINK FENCE
CHAIN LINK FENCE

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

PRELIMINARY
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SCALE	AS NOTED	
DRAWN BY	0072	8/25/00
CHECKED BY	SMY	10/11/00
APPROVED	MJO	04/12/01

MICHAEL J. OELRICH 9785PE — MONTANA REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
WASTE STOCKPILES AND HAUL ROUTES

N.Y. APPROP. NO. PLANT NO.

ASARCO

DRAWING NUMBER: 08–1–9971 REV.

UPDATE TIME: 11:23AM
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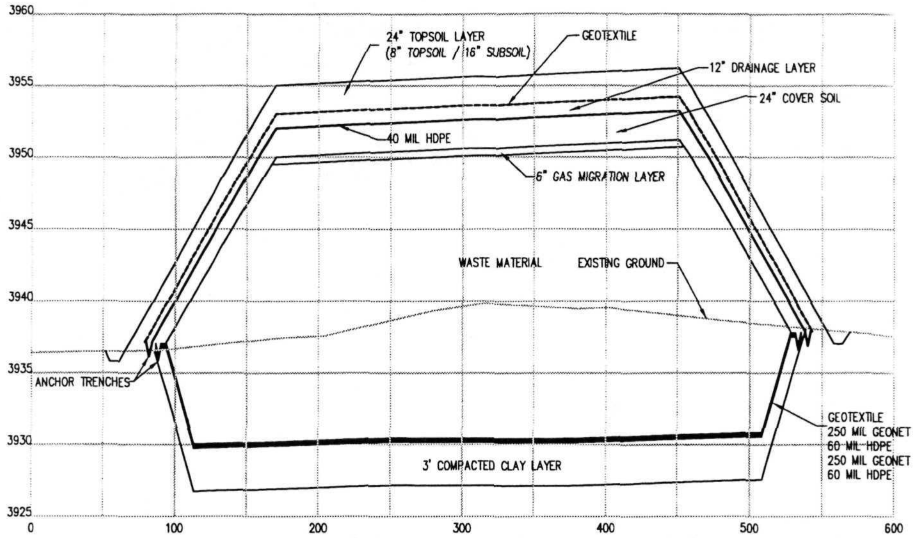

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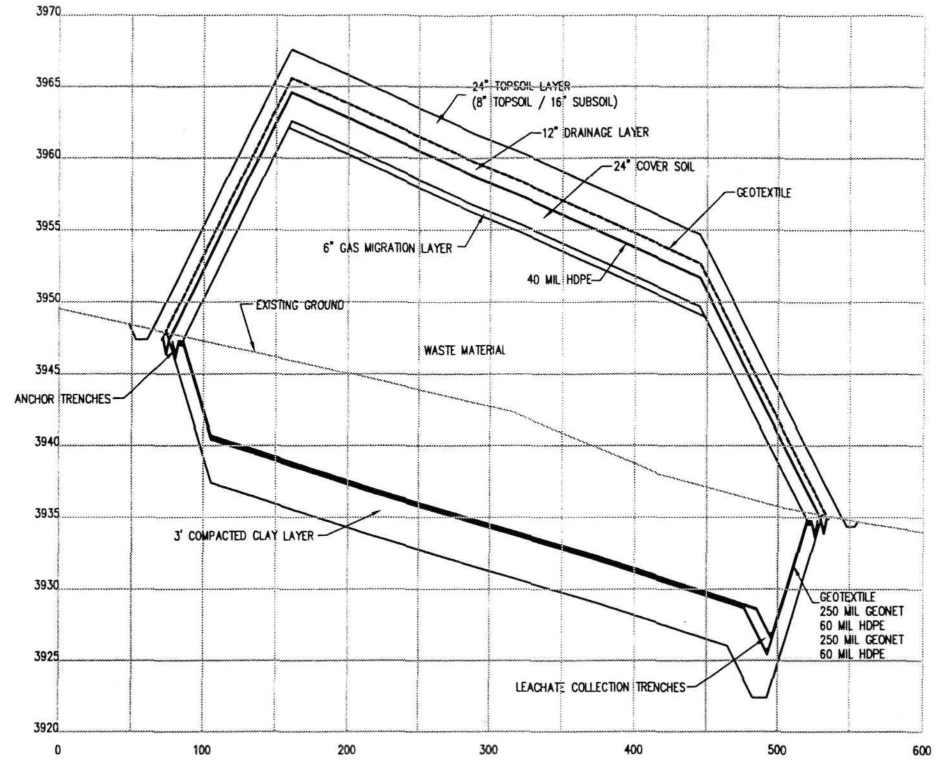

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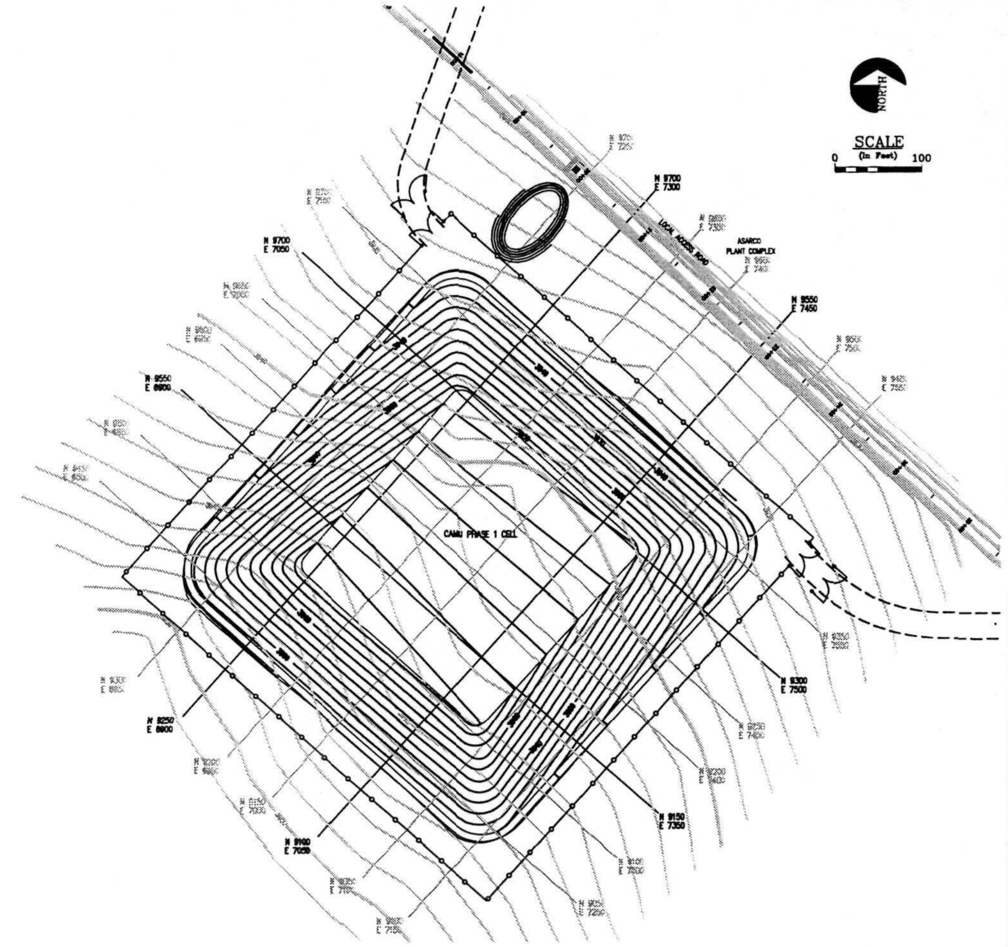
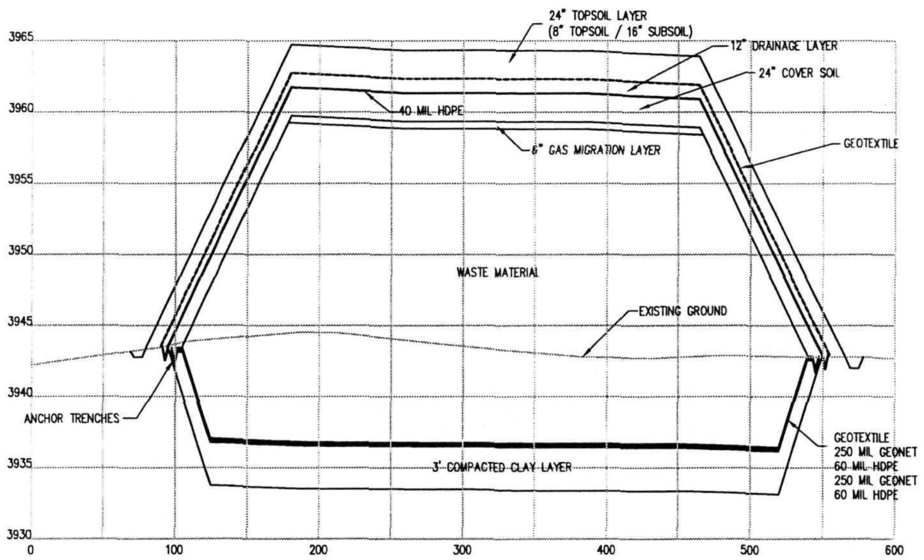


CAMU PLAN VIEW

SCALE: 1"=100'



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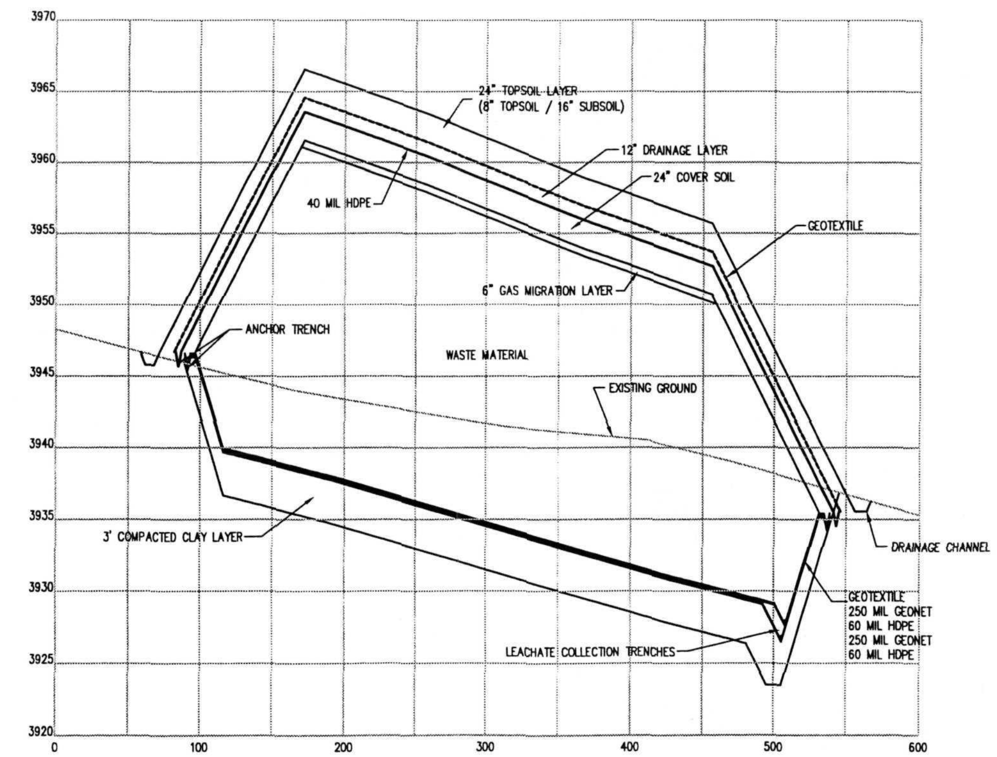

CROSS SECTION 9100.0(N), 7050.0(E) – 9550.0(N), 7450.0(E)

SCALE: (H) 1"=60' (V) 1"=6'

REFERENCES

DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

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DRAWN BY	0127	6/10
CHECKED BY	SMY	10/11/00
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MONTANA — MICHAEL J. OELRICH 9785PE — REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
CROSS SECTIONS

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

N.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9972 | REV.: △

UPDATE TIME: 11:22AM
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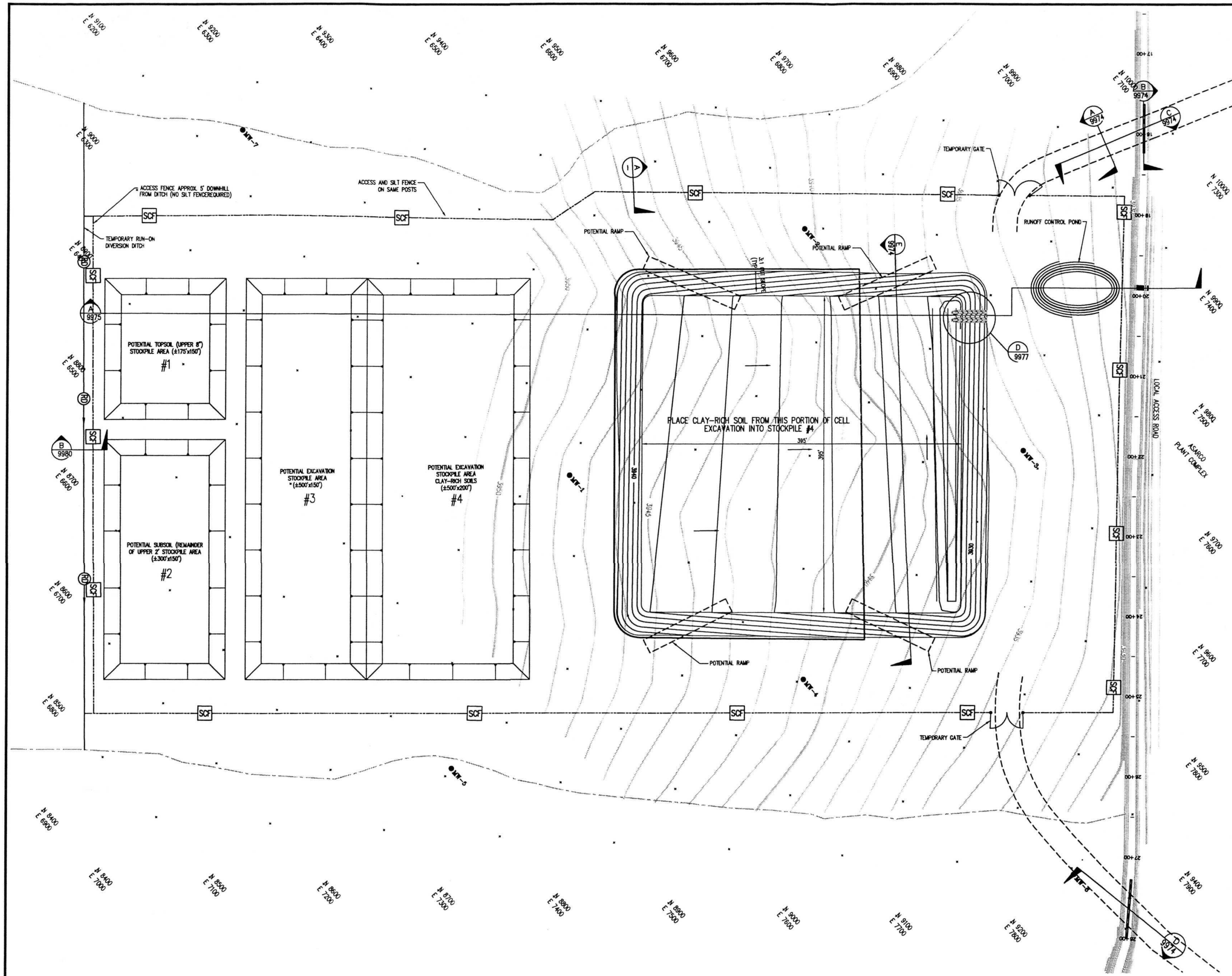

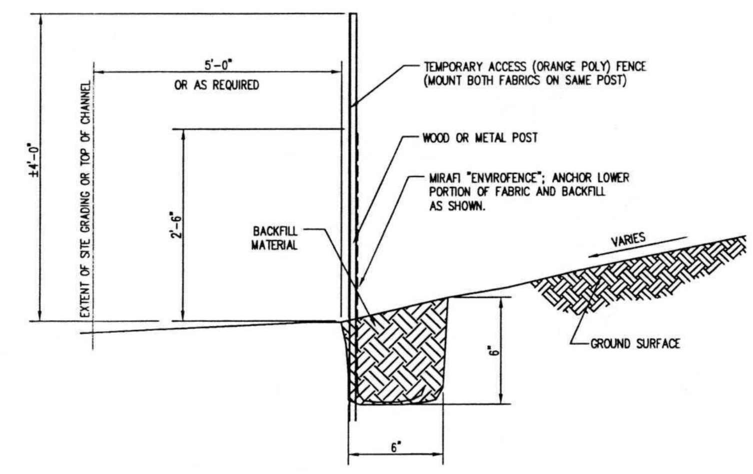

SECTION A — SCALE: NTS — ACCESS AND SEDIMENT CONTROL FENCE DETAIL

NORTH

SCALE (In Feet): 60 0 60 120 180

LEGEND

- LOCAL ACCESS ROAD
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- GRADE BREAK
- ROAD CULVERT
- PROPOSED GRAVEL ACCESS ROAD
- SCF — SEDIMENT CONTROL & SAFETY FENCE
- RD — RUN-ON DIVERSION DITCH
- RIPRAP SLOPE DRAIN
- DRAINAGE FLOW DIRECTION
- MONITORING WELL

NOTES:
1. PLACE UPPER 8" OF TOPSOIL FROM EXCAVATION OF CELL INTO STOCKPILE #1
2. PLACE REMAINDER OF UPPER 2' OF SOIL FROM EXCAVATION OF CELL INTO STOCKPILE #2
3. PLACE CLAY-RICH FROM SOUTHWEST PORTION OF CELL EXCAVATION INTO STOCKPILE #4
4. PLACE REMAINDER OF CELL EXCAVATION IN STOCKPILE #3
5. DO NOT DISTURB EXISTING MONITORING WELLS.

EROSION CONTROL PLAN – EXCAVATION PHASE

SCALE: 1"=60'

Prepared By: Hydrometrics, Inc. — Consulting Scientists, Engineers, and Contractors

DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

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SCALE	AS-NOTED	
DRAWN BY	0072	9/27/00
CHECKED BY	SMY	10/11/00
APPROVED	MJO	10/12/00

MICHEAL J. OELRICH 9785PF — MONTANA — REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated

EAST HELENA PLANT

EAST HELENA — MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
EXCAVATION SITE PLAN AND
EROSION CONTROL PLAN – EXCAVATION PHASE

W.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9973 — REV.: △

UPDATE TIME: 11:00AM
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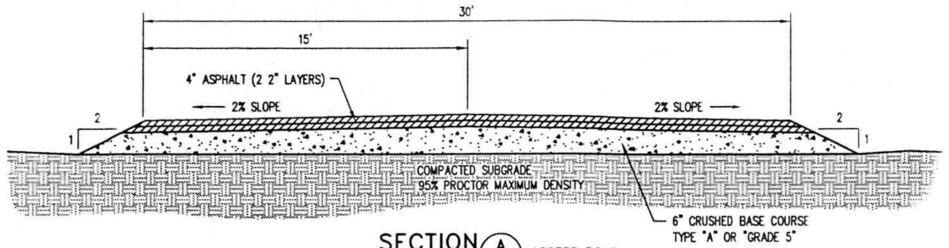
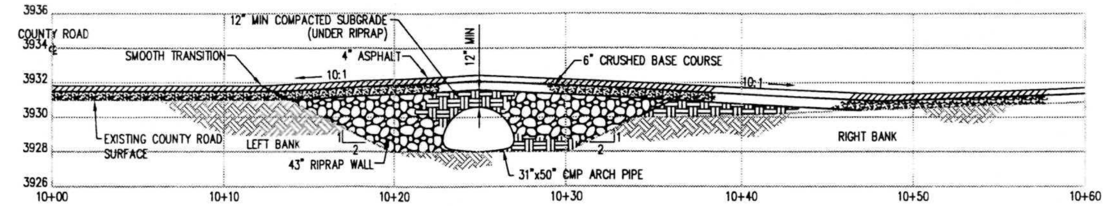
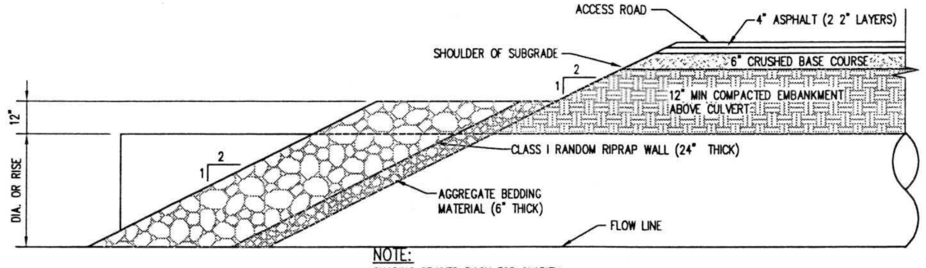


SECTION (A/–) ACCESS ROAD
SCALE: NTS

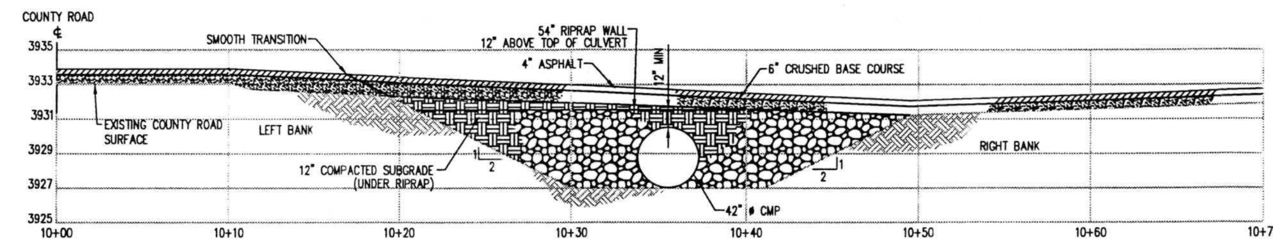


SECTION (C/–) NORTHWEST ACCESS ROAD
SCALE: (H & V) 1"=5

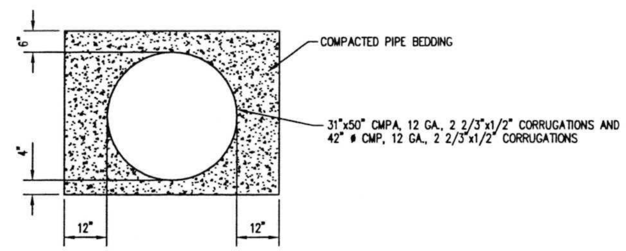


NOTE:
SHADING GRAYED BACK FOR CLARITY

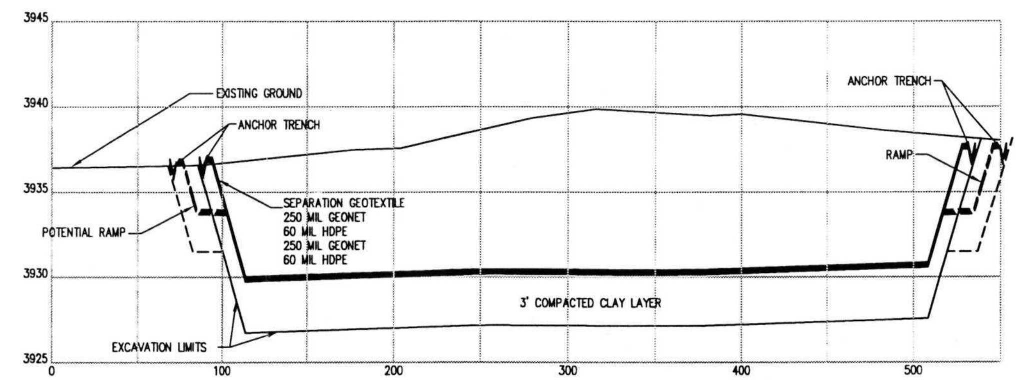
DETAIL (1/–) RIPRAP WALL
SCALE: 3/8"=1'-0"



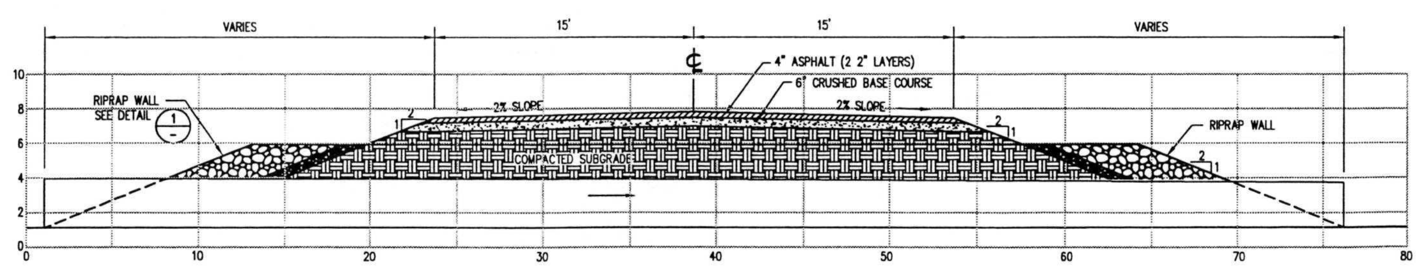
SECTION (D/–) SOUTHEAST ACCESS ROAD
SCALE: (H & V) 1"=5



DETAIL (2/–) PIPE BEDDING
SCALE: 1/2"=1'



SECTION (E/–) TYPICAL POTENTIAL RAMP SECTION
SCALE: (H) 1"=50 (V) 1"=5'



NORTHWEST CULVERT: DESIGN Q_{100}=44 CFS, S=0.0010 FT/FT, L=58'
SOUTHEAST CULVERT: DESIGN Q_{100}=58 CFS, S=0.0015 FT/FT, L=66'

SECTION (B/–) TYPICAL CULVERT PROFILE
SCALE: 1"=5'-0"

NOTE:
LENGTH VARIES BASED ON HEIGHT OF ACCESS ROAD.
PIPE BEDDING NOT SHOWN FOR CLARITY SEE DETAIL (2/–)

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

REFERENCES DWG. NO.	TITLE

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SCALE	AS-NOTED	
DRAWN BY	0072	9/7/00
CHECKED BY	SMY	10/11/00
APPROVED	MJO	10/12/00

MONTANA MICHAEL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
ACCESS ROAD SECTIONS AND DETAILS

W.Y. APPROP. NO.
PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9974
REV.: △

UPDATE TIME: 4:37PM
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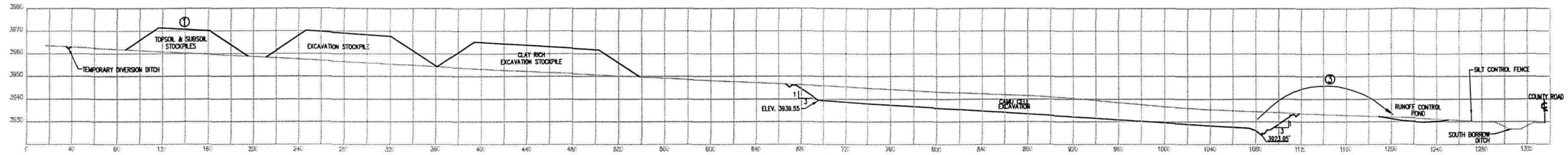
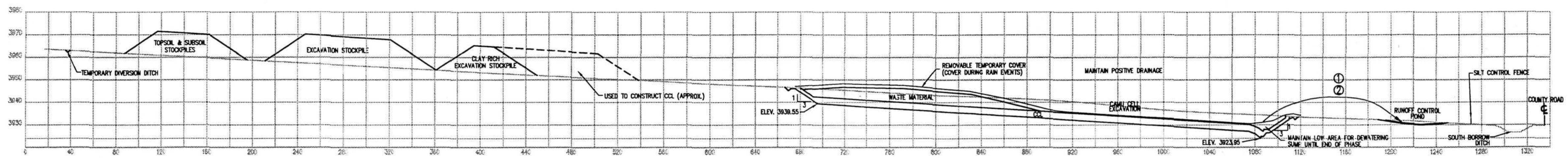


SECTION (A) EXCAVATION PHASE
SCALE: (H) 1"=50' (V) 1"=25'

① EXCAVATE AND STOCKPILE TOPSOIL AND SUBSOIL BEFORE EXCAVATING CELL.

② DIRECT CLEAN WATER AROUND DISTURBED AREAS TO BORROW DITCH.

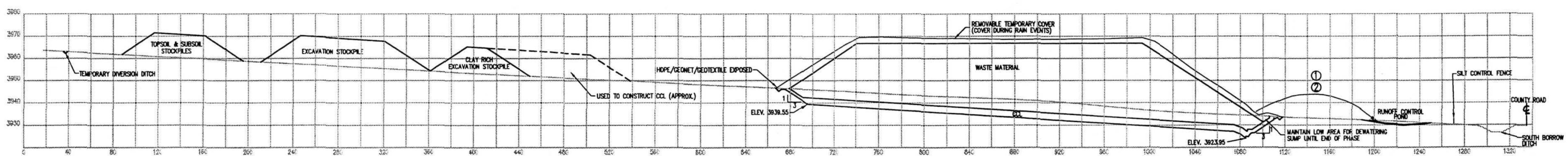
③ WATER THAT CONTACTS DISTURBED AREAS IS ROUTED TO RUNOFF CONTROL POND.



SECTION (A) DURING INTERMEDIATE WASTE MATERIAL PLACEMENT PHASE
SCALE: (H) 1"=50' (V) 1"=25'

① DIRECT CLEAN WATER AROUND DISTURBED AREAS TO BORROW DITCH. WATER PONDING ON TEMPORARY COVER WILL BE PUMPED TO RUNOFF CONTROL POND.

② WATER THAT CONTACTS DISTURBED AREAS IS ROUTED TO RUNOFF CONTROL POND. MAINTAINED LOW AREA SUMP.



SECTION (A) FINAL WASTE MATERIAL PLACEMENT PHASE
SCALE: (H) 1"=50' (V) 1"=25'

① DIRECT CLEAN WATER AROUND DISTURBED AREAS TO BORROW DITCH. WATER PONDING ON TEMPORARY COVER WILL BE PUMPED TO RUNOFF CONTROL POND.

② WATER THAT CONTACTS DISTURBED AREAS IS ROUTED TO RUNOFF CONTROL POND. MAINTAINED LOW AREA SUMP.

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

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9970	DRAWING REFERENCE LIST

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SCALE	AS-NOTED	
DRAWN BY	0249	8/25/00
CHECKED BY	SMY	10/12/00
APPROVED	MJO	04/12/01

MONTANA MICHAEL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

ASARCO INCORPORATED – EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
EROSION CONTROL PLAN – WASTE PLACEMENT PHASE

N.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08–1–9975 REV. △

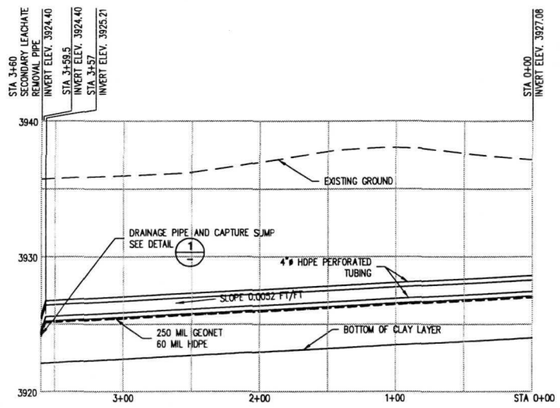
UPDATE TIME: 4:38PM
007\0127\065\0072\HEL\041201\r:\Land Projects\1270b201\DWG\2708201H012.dwg

PLAN VIEW WITH CROSS SECTION LOCATIONS

SCALE: 1"=50'

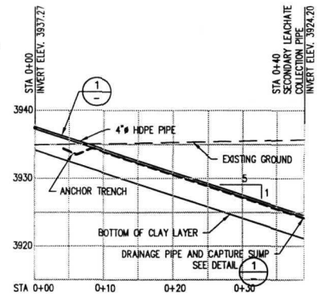
LEGEND

- LOCAL ACCESS ROAD
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- GRADE BREAK
- ROAD CULVERT
- PROPOSED GRAVEL ACCESS ROAD



SECTION A — LEACHATE COLLECTION PIPE PROFILE

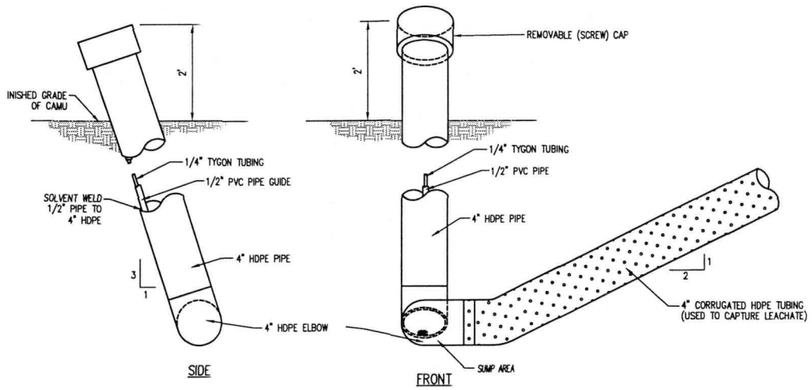
SCALE: (H)1"=50' (V)1"=5'



SECTION B — LEACHATE REMOVAL PIPE

SCALE: (H)1"=10' (V)1"=10'

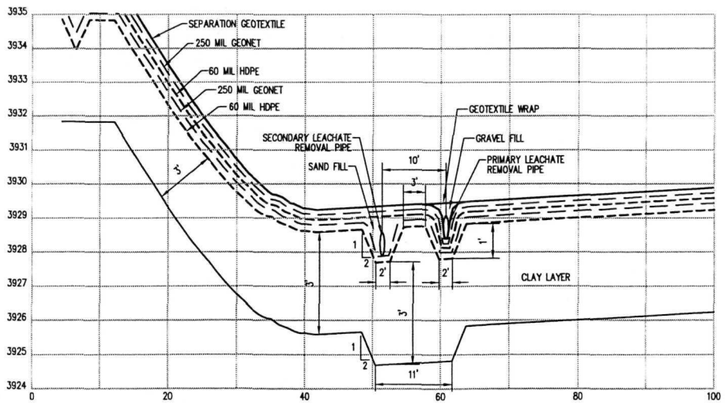
NOTE:
FORM TUBING CHANNEL PRIOR TO HDPE AND GEONET PLACEMENT



DETAIL 1 — DRAINAGE PIPE, CAPTURE SUMP AND STAND PIPE

SCALE: 1"=6'

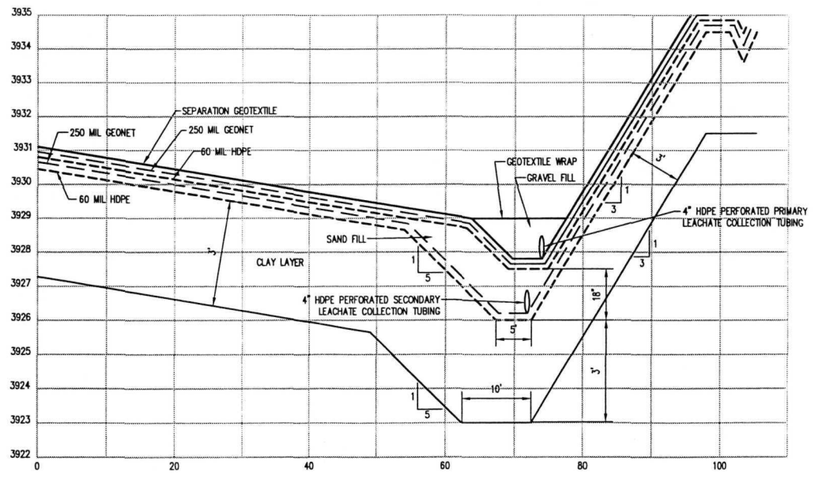
NOTE:
TUBING AND PIPE GUIDE EXTENDED FROM SUMP ELBOW TO CAP.
SEE ALSO LINER PENETRATION DETAILS 2/9981 3/9981 4/9981 5/9981 6/9981 7/9981



SECTION C — LEACHATE REMOVAL PIPE TROUGH WITH LINERS

SCALE: (H)1"=10' (V)1"=2'

NOTE:
LINER, GEONET AND GEOTEXTILE NOT SHOWN TO SCALE



SECTION D — LEACHATE COLLECTION SYSTEM WITH LINERS

SCALE: (H)1"=10' (V)1"=2'

NOTES:
1. FORM TUBING CHANNEL PRIOR TO HDPE AND GEONET PLACEMENT.
2. LINER, GEONET AND GEOTEXTILE NOT SHOWN TO SCALE.
3. COMPACTED CLAY LINE 3.0' MEASURED PERPENDICULAR TO THE SLOPE.

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES

DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

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SCALE	AS-NOTED	
DRAWN BY	0072	9/19
CHECKED BY	SMY	10/11/00
APPROVED	MJM	04/12/01

MICHAEL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT

EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
LEACHATE DETECTION, COLLECTION, AND REMOVAL SYSTEM
SECTIONS AND DETAILS

N.Y. APPROP. NO.	PLANT NO.

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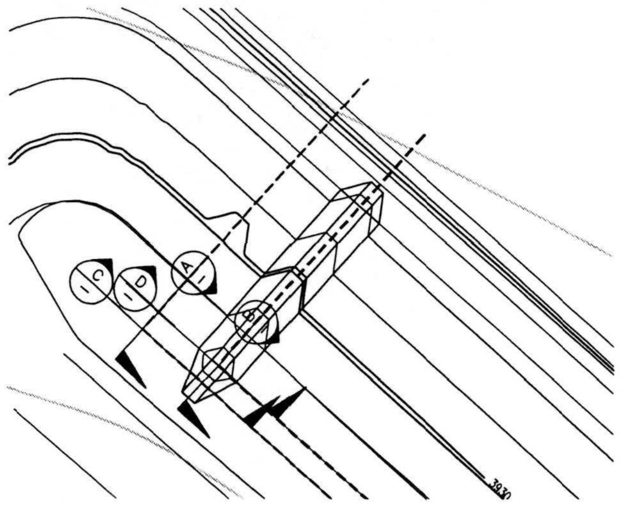
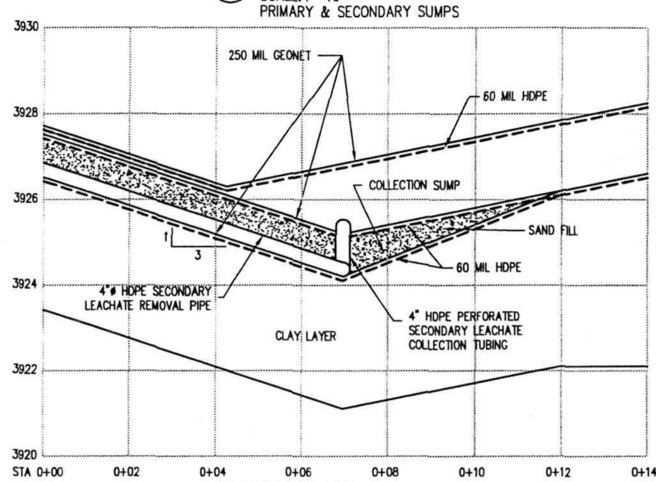
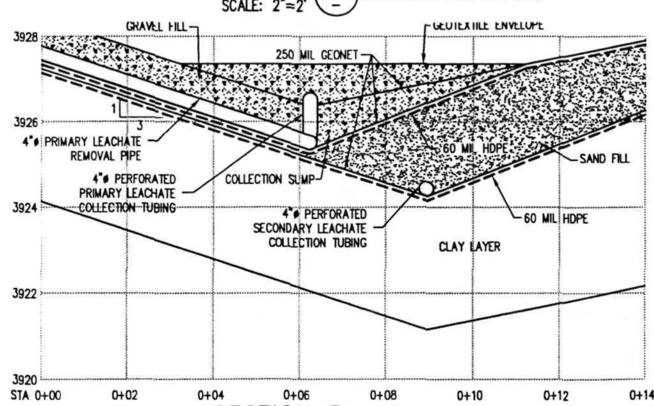


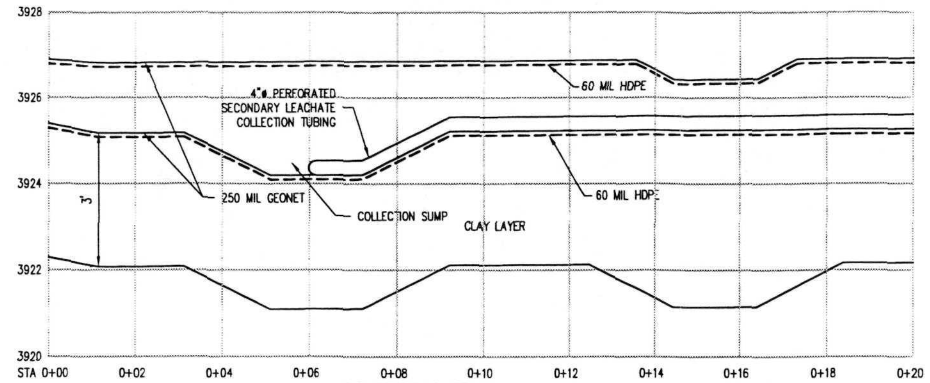
1 DETAIL
SCALE: 1"=10'
PRIMARY & SECONDARY SUMPS



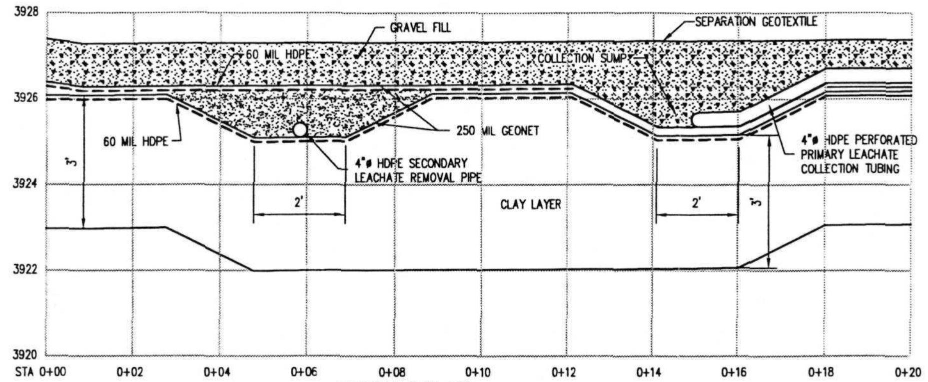
SECTION A SECONDARY PIPE AND SUMP
SCALE: 2"=2'



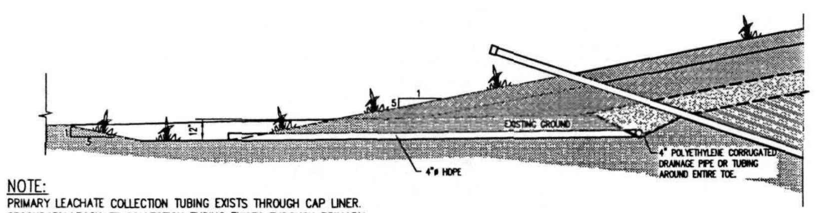
SECTION B PRIMARY PIPE AND SUMP
SCALE: 1"=2'



SECTION C SECONDARY PIPE AND SUMP
SCALE: 1"=2'

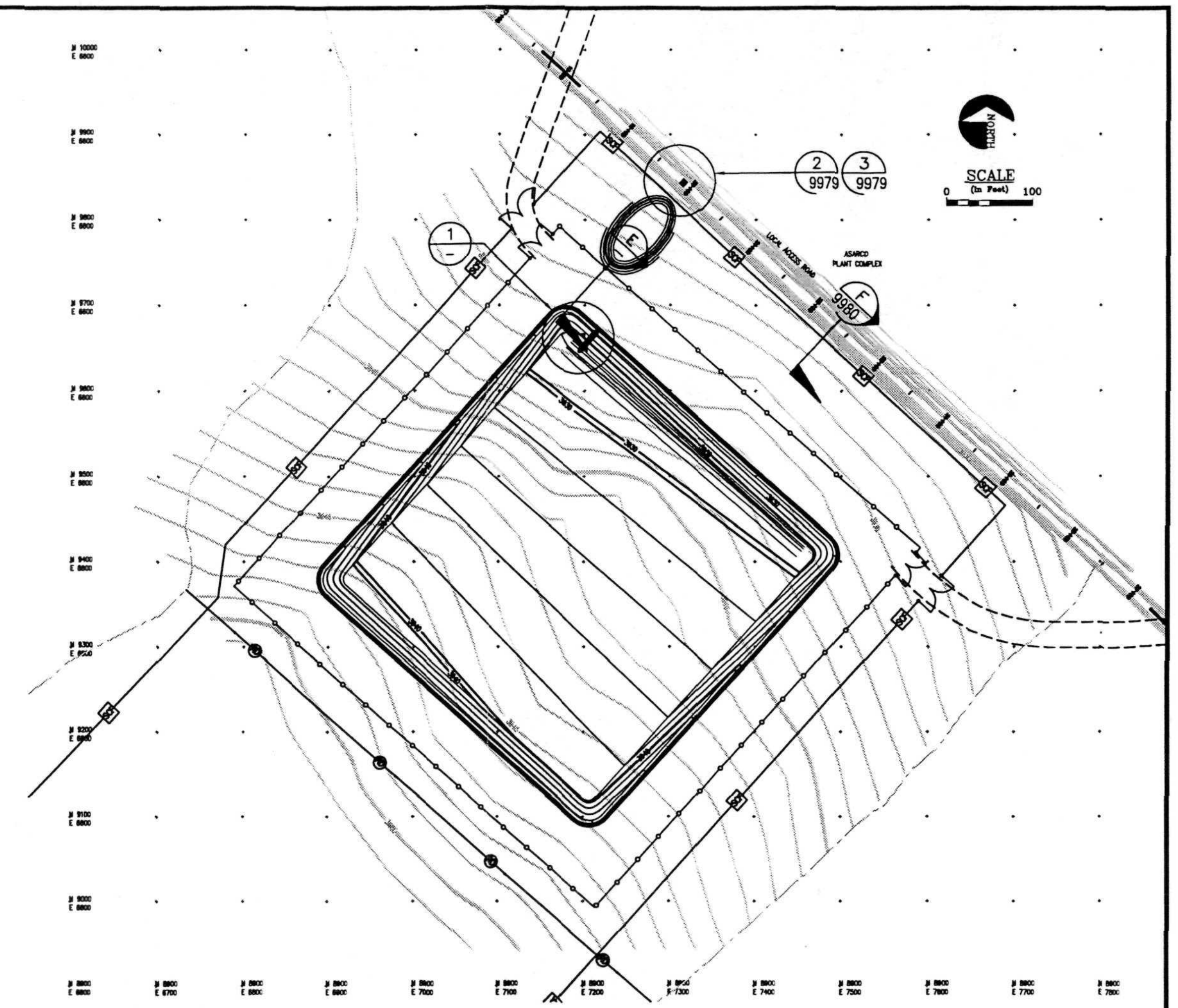


SECTION D PRIMARY PIPE AND SUMP
SCALE: 1"=2'

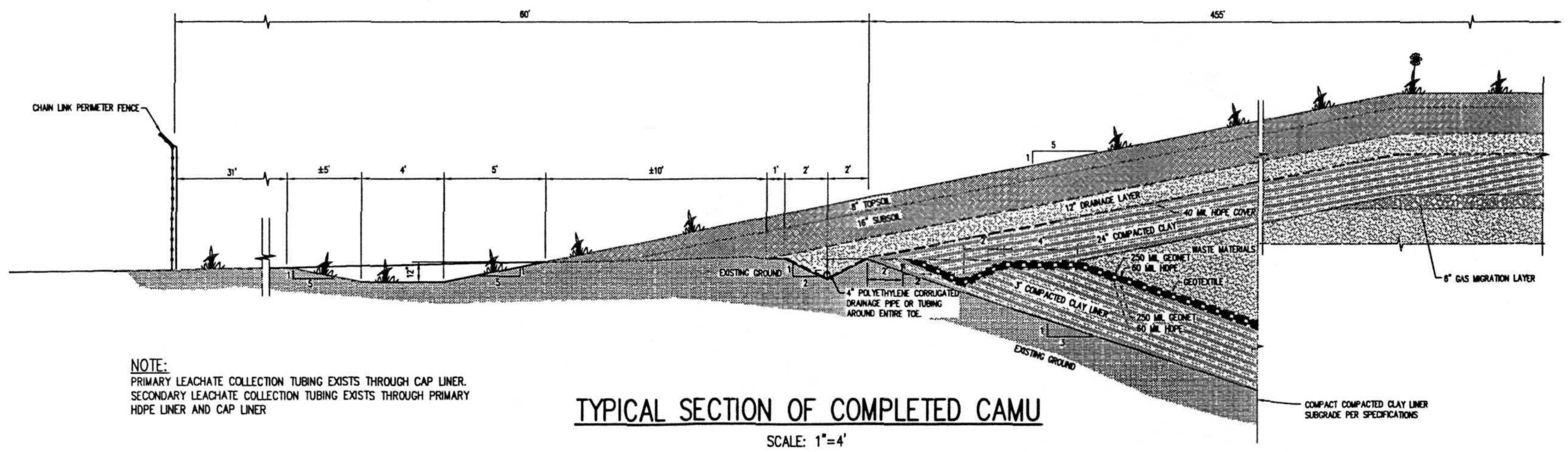


NOTE:
PRIMARY LEACHATE COLLECTION TUBING EXISTS THROUGH CAP LINER.
SECONDARY LEACHATE COLLECTION TUBING EXISTS THROUGH PRIMARY HDPE LINER AND CAP LINER

SECTION E TOE DRAIN
SCALE: 1"=4'



CAMU PLAN VIEW
SCALE: 1"=100'



NOTE:
PRIMARY LEACHATE COLLECTION TUBING EXISTS THROUGH CAP LINER.
SECONDARY LEACHATE COLLECTION TUBING EXISTS THROUGH PRIMARY HDPE LINER AND CAP LINER

TYPICAL SECTION OF COMPLETED CAMU
SCALE: 1"=4'

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

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SCALE	AS NOTED	
DRAWN BY	0127	6/10/99
CHECKED BY	SMY	10/11/00
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MONTANA — MICHAEL J. OELRICH 9785PE — REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

ASARCO INCORPORATED—EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
PRIMARY AND SECONDARY SUMP
DETAILS

N.Y. APPROP. NO.	PLANT NO.

ASARCO

DRAWING NUMBER	REV.
08–1–9977	△

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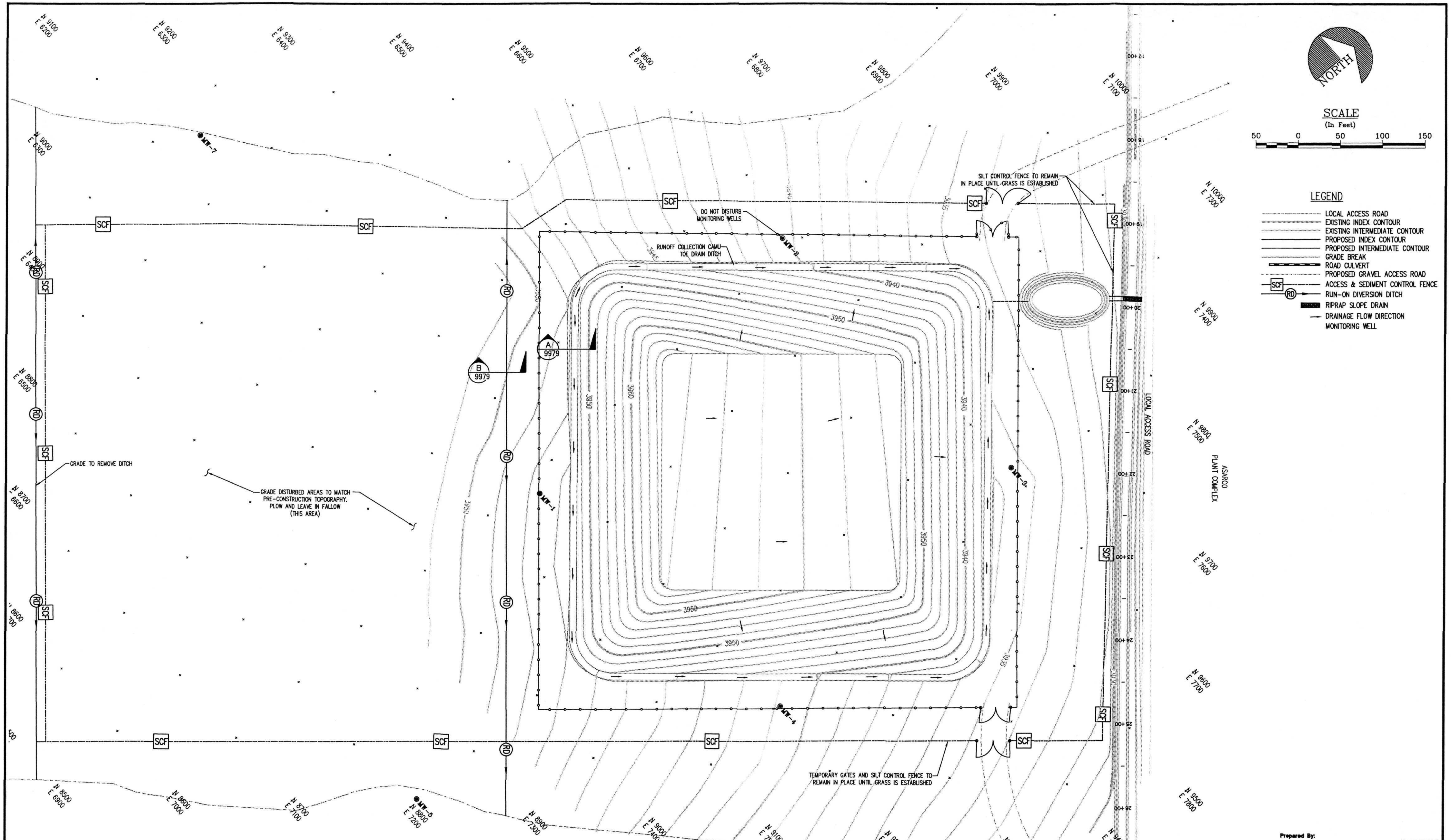

EROSION CONTROL PLAN – CAP CONSTRUCTION PHASE

SCALE: 1"=50'

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

REFERENCES DWG. NO.	TITLE

REVISIONS NO.	BY	DATE	DESCRIPTION

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PRELIMINARY	
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ISSUED BY	
DATE	

SCALE	AS–NOTED	
DRAWN BY	0072	9/24/00
CHECKED BY	SMY	10/11/00
APPROVED		04/12/01

MICHEAL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER MONTANA

ASARCO Incorporated
EAST HELENA PLANT

EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT

CAMU (RCRA LANDFILL) – PHASE I CELL

EROSION CONTROL PLAN –

CAP CONSTRUCTION PHASE

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

N.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08–1–9978 REV. △

UPDATE TIME: 1:58PM
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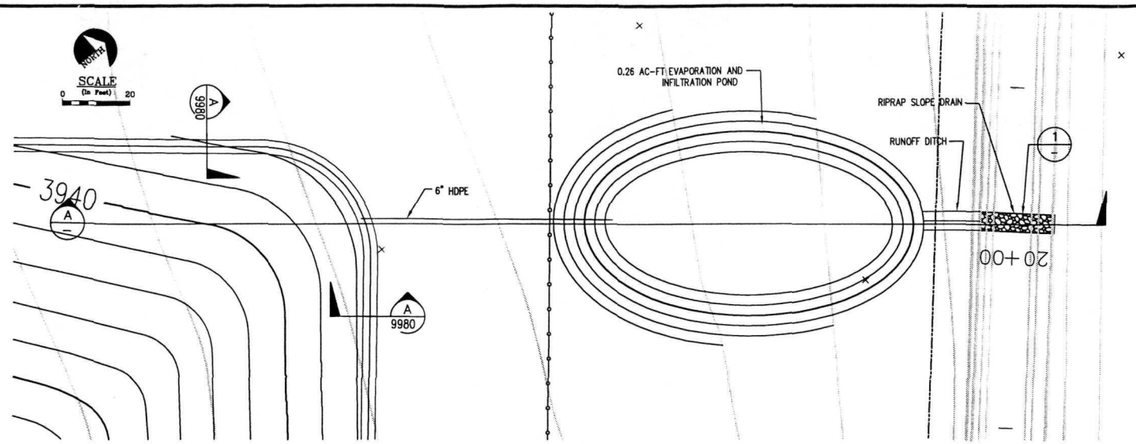
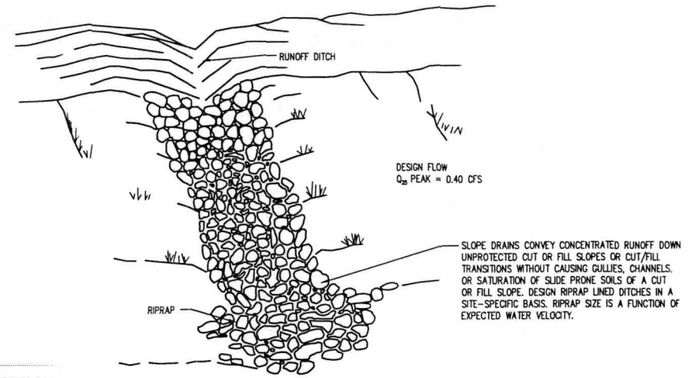
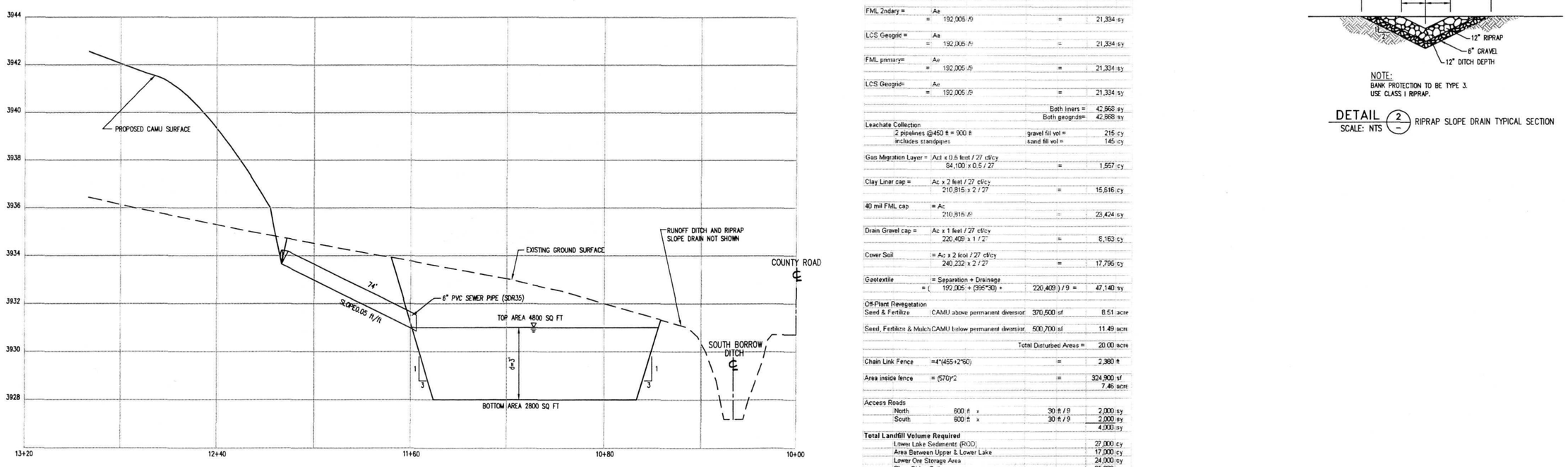


RUNOFF CONTROL POND PLAN VIEW

SCALE: 1"=20'



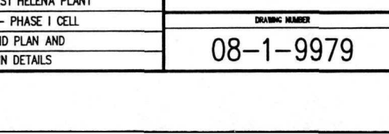
DETAIL (1) SCALE: NTS — RIPRAP SLOPE DRAIN



SECTION (A) SCALE: (H) 1"=20 (V) 1"=2' — RUNOFF CONTROL POND

ITEMIZED QUANTITIES FOR CONSTRUCTION ACTIVITIES
(Rough Quantities for Bidding Only)

Remove Top Soil =	At x 2foot / 27 cf/cy			
	= 207,025 x 2' / 27		=	15,335 cy
	Top 8"	5,112 cy		
	Next 16"	10,223 cy		
Excavate Cell =	Vb / 27 cf/cy - Top Soil			
	= 1,815,250 /27-		15,335 =	51,806 cy
			Total excavation	67,231 cy
Grade Bottom & Compact Subgrade=	Ae x 0.5' / 27 cf/cy			
	= 206,784 sf x 0.5' / 27cf/cy =			3,866 cy
				23,309 sy
Clay Liner =	Ae x 3 feet / 27 cf/cy			
	= 206,784 x 3 / 27		=	23,309 cy
FML 2ndary =	Ae			
	= 192,005 /9		=	21,334 sy
LCS Geogrid =	Ae			
	= 192,005 /9		=	21,334 sy
FML primary=	Ae			
	= 192,005 /9		=	21,334 sy
LCS Geogrid=	Ae			
	= 192,005 /9		=	21,334 sy
			Both liners =	42,668 sy
			Both geogrids=	42,668 sy
Leachate Collection				
	2 pipelines @450 ft = 900 ft		gravel fill vol =	215 cy
	includes standpipes		sand fill vol =	145 cy
Gas Migration Layer =	Acl x 0.5 feet / 27 cf/cy			
	84,100 x 0.5 / 27		=	1,557 cy
Clay Liner cap =	Ac x 2 feet / 27 cf/cy			
	210,815 x 2 / 27		=	15,616 cy
40 mil FML cap	= Ac			
	210,815 /9		=	23,424 sy
Drain Gravel cap =	Ac x 1 feet / 27 cf/cy			
	220,409 x 1 / 27		=	8,163 cy
Cover Soil	= Ac x 2 feet / 27 cf/cy			
	240,232 x 2 / 27		=	17,796 cy
Geotextile	= Separation + Drainage			
	= (192,005 + (395*30) +	220,409) / 9 =		47,140 sy
Off-Plant Revegetation				
Seed & Fertilize	CAMU above permanent diversion:	370,500 sf		8.51 acre
Seed, Fertilize & Mulch	CAMU below permanent diversion:	500,700 sf		11.49 acre
			Total Disturbed Areas =	20.00 acre
Chain Link Fence	=4*(455+2*60)		=	2,380 ft
Area inside fence	= (570)^2		=	324,900 sf
				7.46 acre
Access Roads				
North	600 ft x		30 ft / 9	2,000 sy
South	600 ft x		30 ft / 9	2,000 sy
				4,000 sy
Total Landfill Volume Required				
	Lower Lake Sediments (ROD)			27,000 cy
	Area Between Upper & Lower Lake			17,000 cy
	Lower Ore Storage Area			24,000 cy
	Shew Ridge Soils			35,000 cy
	Other			10,000 cy
			Total	113,000 cy



NOTE:
BANK PROTECTION TO BE TYPE 3.
USE CLASS I RIPRAP.

DETAIL (2) SCALE: NTS — RIPRAP SLOPE DRAIN TYPICAL SECTION

REFERENCES	DWG. NO.	TITLE
	9970	DRAWING REFERENCE LIST

REFERENCES	DWG. NO.	TITLE

REVISIONS	NO.	BY	DATE	DESCRIPTION
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REVISIONS	NO.	BY	DATE	DESCRIPTION
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	3			
	4			
	5			

PRELIMINARY	
REVISED--DESTROY PREVIOUS ISSUE	
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ISSUED BY	
DATE	

SCALE	AS-NOTED		
DRAWN BY	0072	9/1/00	
CHECKED BY	SMY	10/11/00	
APPROVED		10/12/00	

STATE OF MONTANA — MICHAEL J. DELRICH — 9785PE — REGISTERED PROFESSIONAL ENGINEER

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

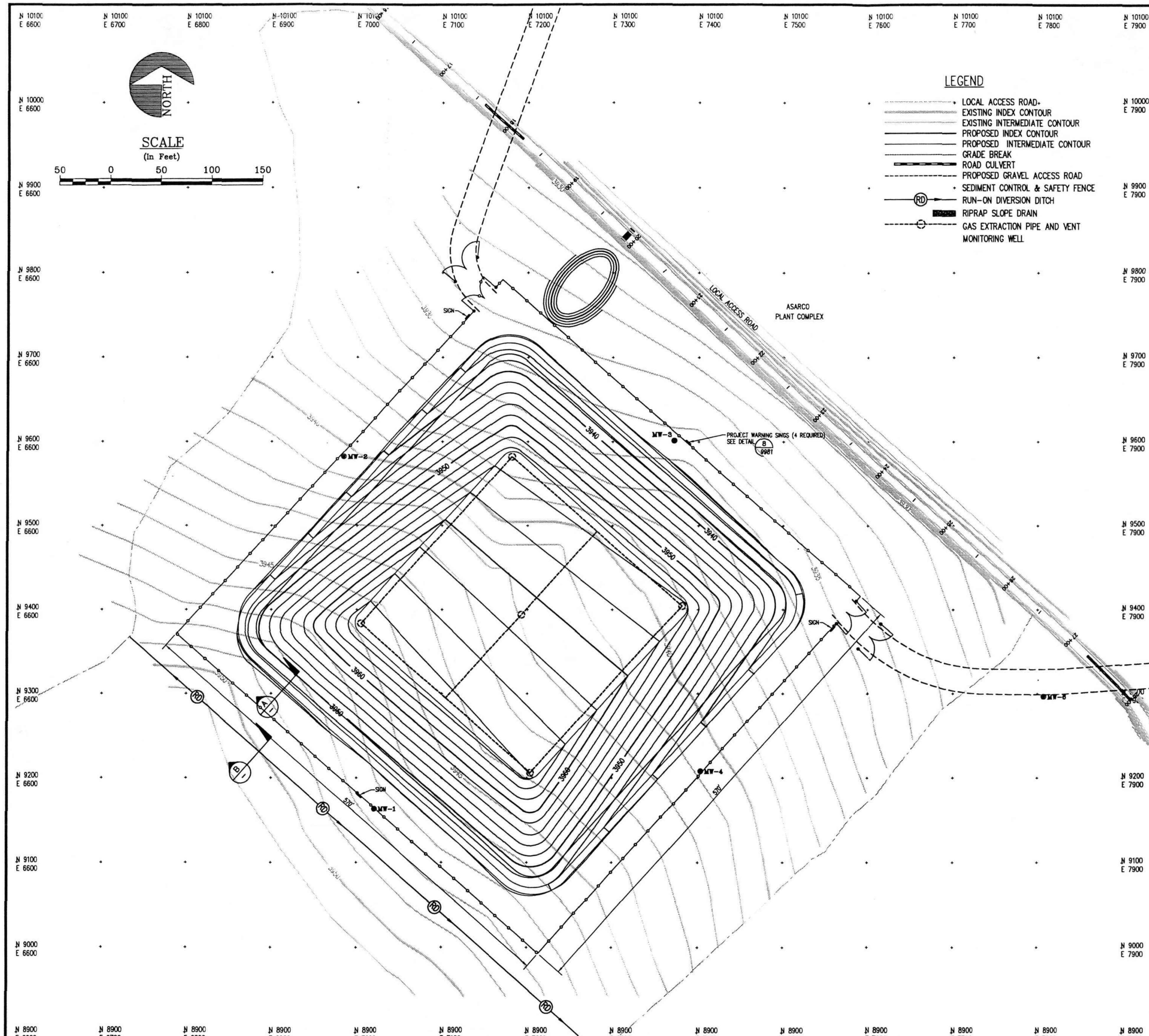
ASARCO INCORPORATED--EAST HELENA PLANT
CAMU (RCRA LANDFILL) - PHASE I CELL
RUNOFF CONTROL POND PLAN AND
RIPRAP SLOPE DRAIN DETAILS

K.Y. APPROP. NO.	PLANT NO.

ASARCO

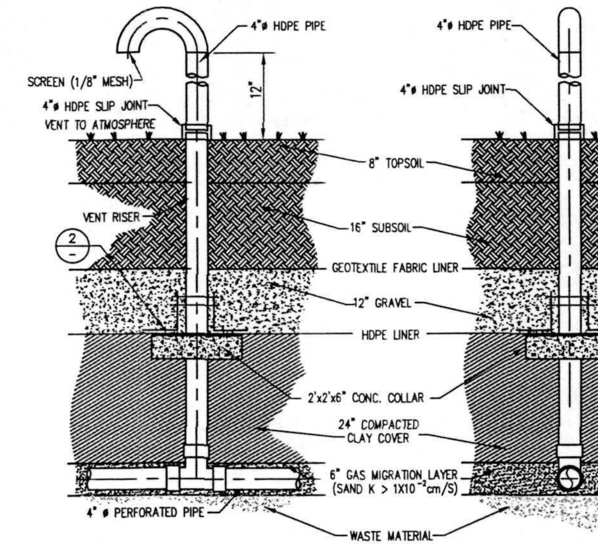
DRAWING NUMBER	REV.
08-1-9979	△

UPDATE TIME: 4:42PM
007_0127\040\0072\HEL\041201\A\Land Projects\1270b201\DWG\1270B201H008.dwg

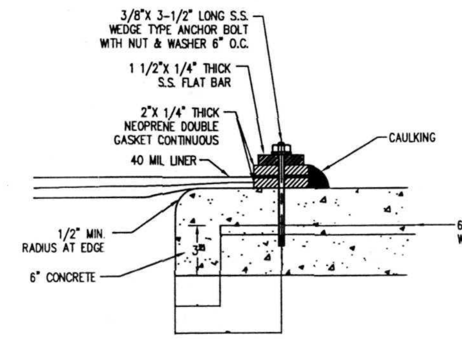


FINISHED GRADE PLAN WITH GAS VENT LOCATIONS

SCALE: 1"=50'

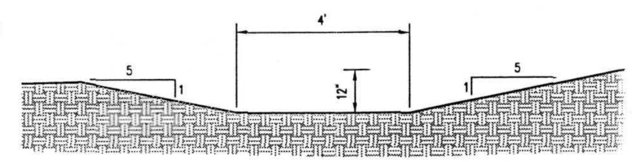


DETAIL 1 – VENT PIPE SECTION
SCALE: NTS

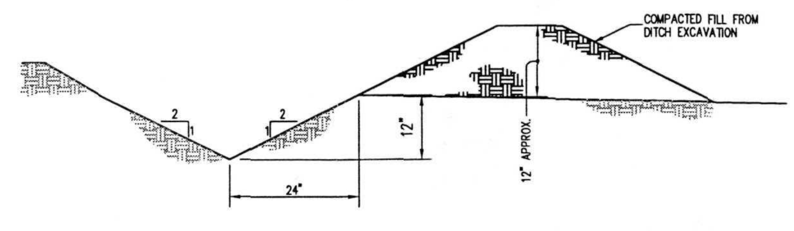


DETAIL 2 – BATTEN TYPE CONCRETE ATTACHMENT
SCALE: NTS

NOTES:
1. CONCRETE SURFACES AT ATTACHMENT LOCATIONS TO BE STEEL TROWEL FINISHED OR GROUND SMOOTH PRIOR TO INSTALLATION.
2. AVOID VERTICAL WALL ATTACHMENT WHENEVER POSSIBLE.
3. WHEN USING GEOTEXTILE OR DRAINAGE NET, DO NOT TERMINATE BENEATH BATTEN BAR.



SECTION A – CAMU TOE DRAIN DETAIL
SCALE: 1"=2'



SECTION B – DIVERSION DITCH
SCALE: 3/4"=1'

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
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PRELIMINARY
REVISED–DESTROY PREVIOUS ISSUE
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DATE

SCALE	AS-NOTED	
DRAWN BY	0249	9/25/00
CHECKED BY	SMY	10/11/00
APPROVED	MICHEAL J. OELRICH 9785PE (PROFESSIONAL ENGINEER, MONTANA)	04/12/01

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

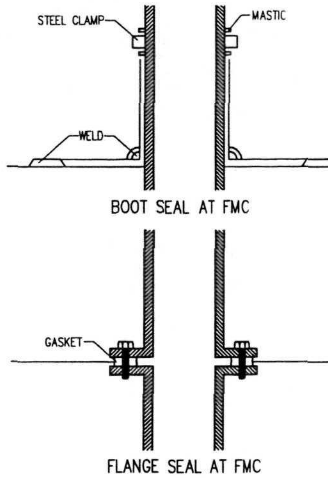
ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
FINISHED GRADE PLAN WITH GAS VENT LOCATIONS AND DETAILS

N.Y. APPROP. NO. | PLANT NO.

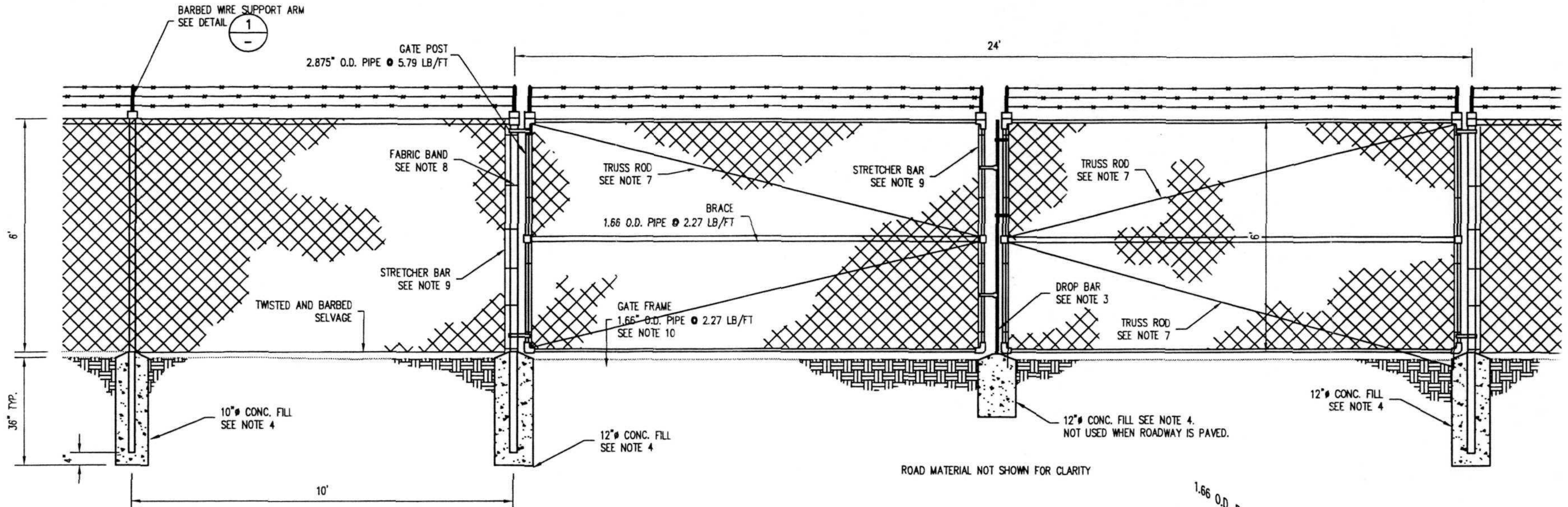
ASARCO

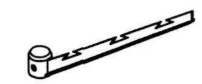
DRAWING NUMBER: 08-1-9980 REV.

UPDATE TIME: 4:43PM
007\0127\045\0072\HEL\041201\F\Land Projects\1270b201\DWG\12708201H007.dwg

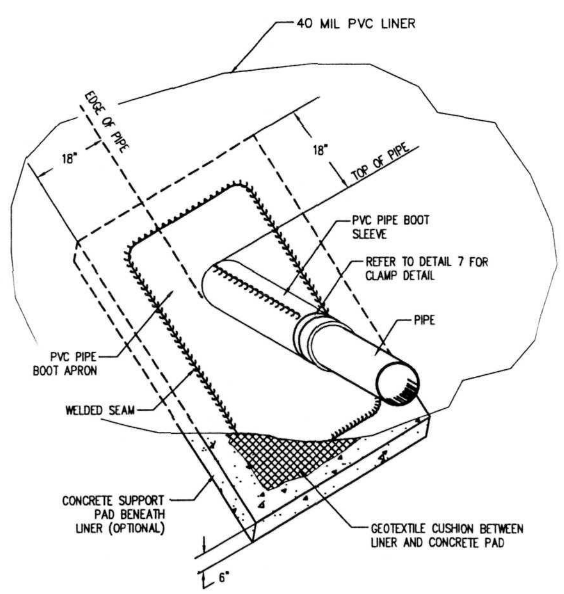


DETAIL 2 — SCALE: NTS — FLANGE SEAL AT FMC

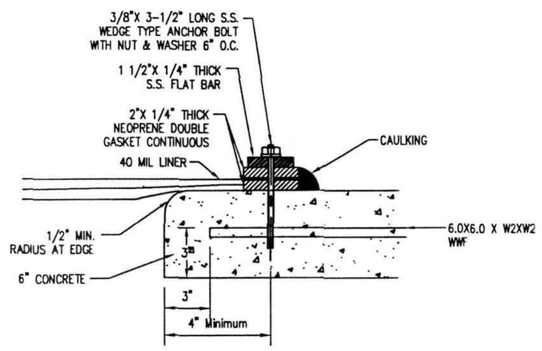




DETAIL 1 — NTS — BARBED WIRE SUPPORT ARM



DETAIL 3 — SCALE: NTS — PIPE BOOT ISOMETRIC



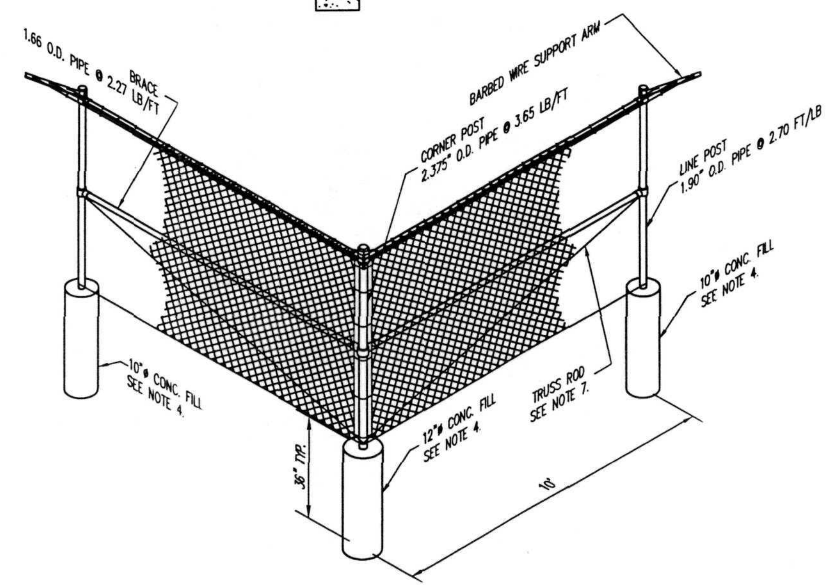
DETAIL 4 — SCALE: NTS — BATTEN TYPE CONCRETE ATTACHMENT

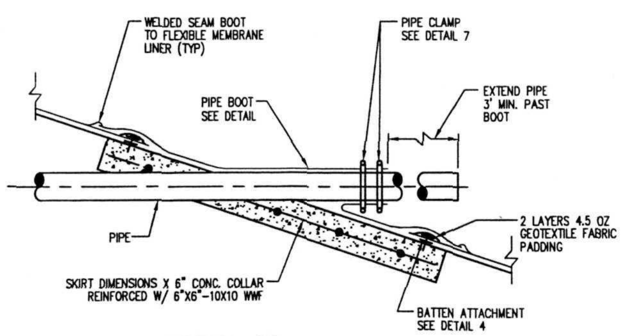
NOTES:
1. CONCRETE SURFACES AT ATTACHMENT LOCATIONS TO BE STEEL TROWEL FINISHED OR GROUND SMOOTH PRIOR TO INSTALLATION.
2. AVOID VERTICAL WALL ATTACHMENT WHENEVER POSSIBLE.
3. WHEN USING GEOTEXTILE OR DRAINAGE NET, DO NOT TERMINATE BENEATH BATTEN BAR.

NOTES:
1. DO NOT INSTALL DOUBLE PANELS MORE THAN 300' APART.
2. PULL POST BRACING IS THE SAME AS IN THE CORNER
3. A DROP BAR LOCKING DEVICE IS REQUIRED FOR ALL DOUBLE GATE INSTALLATIONS. THE DROP BAR MUST BE ABLE TO BE INSERTED INTO THE CONCRETE BLOCK AT LEAST 6"
4. ALL CONCRETE IS CLASS "F" OR BETTER.
5. USE 2-POINT 12-1/2 OR 13-1/2 GAUGE BARB WIRE MEETING ASTM A 121 REQUIREMENTS. SPACE BARBS A NOMINAL 4" OR A NOMINAL 5". ZINC COATING MUST BE CLASS 1 FOR 12-1/2 AND 13-1/2 GAUGE WIRE. PROVIDE THE PROJECT MANAGER CERTIFICATION THAT THE WIRE MEETS ASTM A 121 REQUIREMENTS.
6. FENCE FABRIC MUST HAVE 2" OPENINGS AND MEET AASHTO M 181 REQUIREMENTS. USE 9-GAUGE WIRE FOR FABRIC.
7. FURNISH 3/8" GALVANIZED TRUSS RODS WITH DROP-FORGED TURNBUCKLES OR 3/8" ALUMINUM TRUSS RODS WITH CAST ALUMINUM TURNBUCKLES
8. STEEL BANDS MUST BE A MINIMUM OF 1/8" THICK BY 3/4" WIDE ALUMINUM BANDS MUST BE A MINIMUM OF 1/8" THICK BY 7/8" WIDE.
9. STEEL OR ALUMINUM STRETCHER BARS MUST BE AT LEAST 1/4" THICK BY 3/4" WIDE AND AT LEAST 2" SHORTER THAN THE FABRIC WIDTH USED.
10. THE GATE FRAME CORNERS MAY BE WELDED OR FASTENED AND REINFORCED WITH GALVANIZED MALLEABLE-IRON FITTINGS DESIGNED FOR THIS USE.

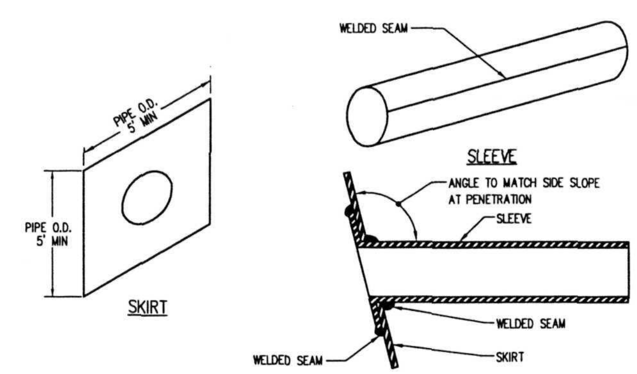
6-FOOT CHAIN LINK FENCE

NTS

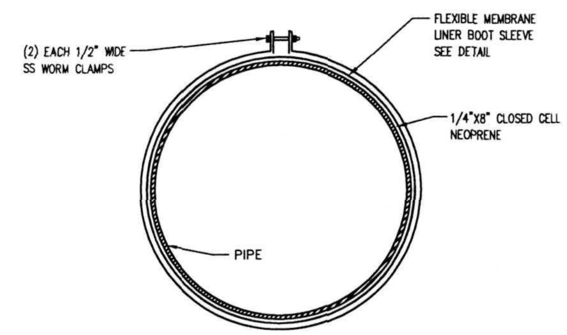




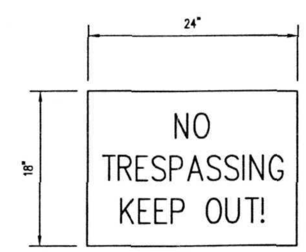
DETAIL 5 — SCALE: NTS — LINER PIPE PENETRATION



DETAIL 6 — SCALE: NTS — TYPICAL PIPE BOOT



DETAIL 7 — SCALE: NTS — TYPICAL PIPE CLAMP



DETAIL 8 — SCALE: NTS

NOTE:
SIGNS SHALL BE MADE FROM ALUMINUM SHEET AS DESCRIBED IN THE SPECIFICATIONS. LETTERS SHALL BE 2" HIGH (MIN.) TYPE A ACRYLIC REFLECTORS. BACKGROUND PAINT SHALL BE RED. A BORDER SIMILAR IN COLOR WILL ALSO BE SUPPLIED.

Prepared By: Hydrometrics, Inc. — Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

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SCALE	AS NOTED	
DRAWN BY	0072	10/10/00
CHECKED BY		
APPROVED	MONTANA — MICHAEL J. OELRICH 9785PE — REGISTERED PROFESSIONAL ENGINEER	

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA — MONTANA, 59635
ASARCO INCORPORATED—EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
MISCELLANEOUS DETAILS

N.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9981 — REV. △

UPDATE TIME: 10:47AM
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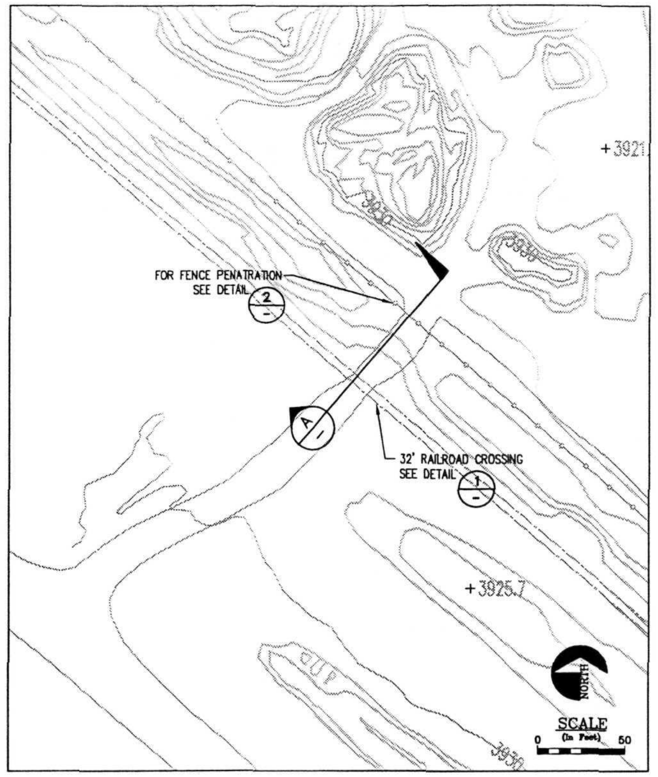
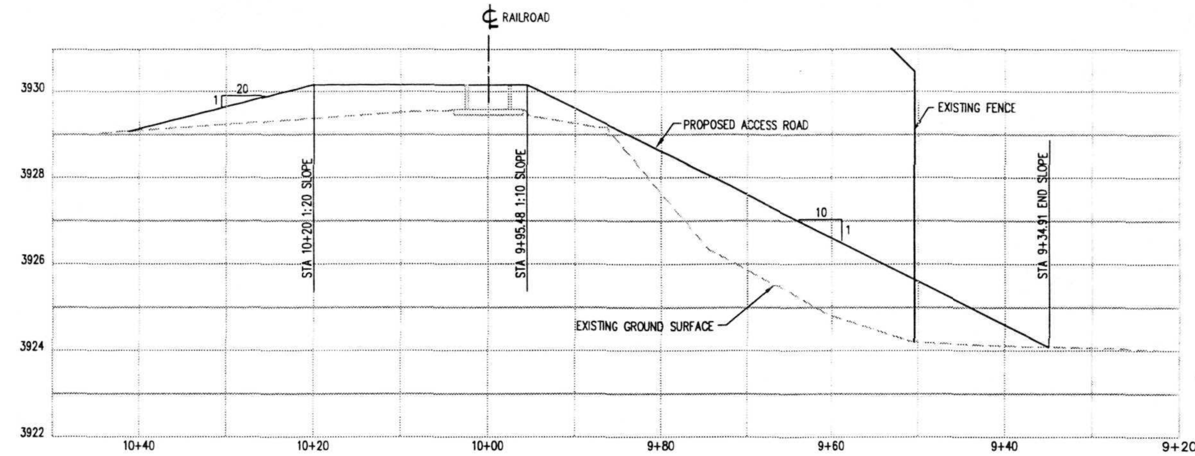
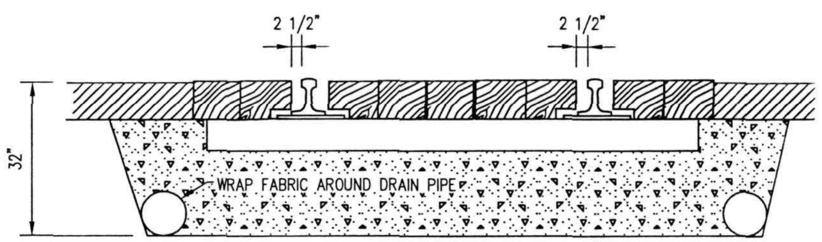
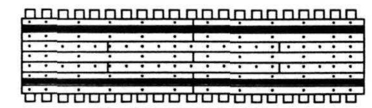




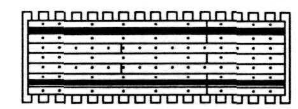
SECTION (A)
SCALE: (H) 1"=10'
(V) 1"=1'



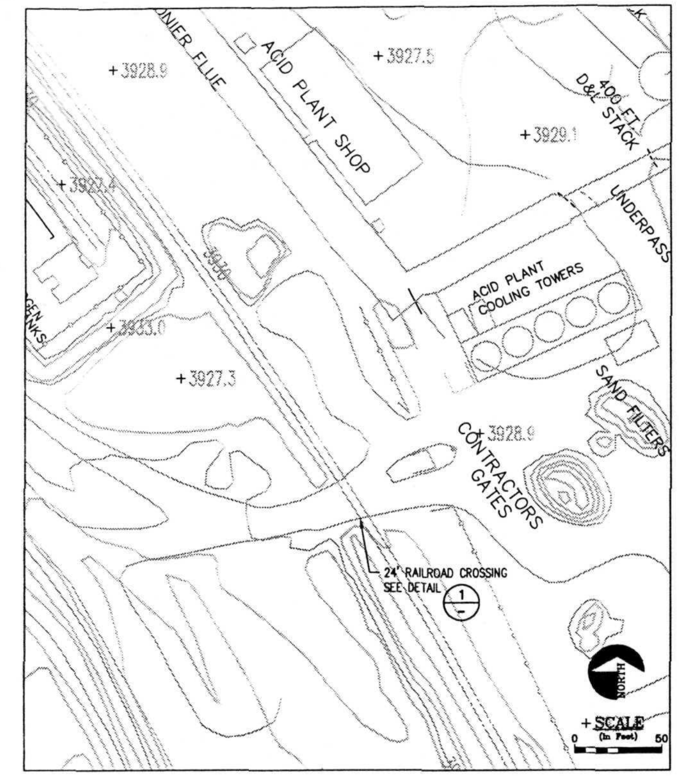
CROSSING SECTION



32' CROSSING PLAN VIEW



24' CROSSING PLAN VIEW

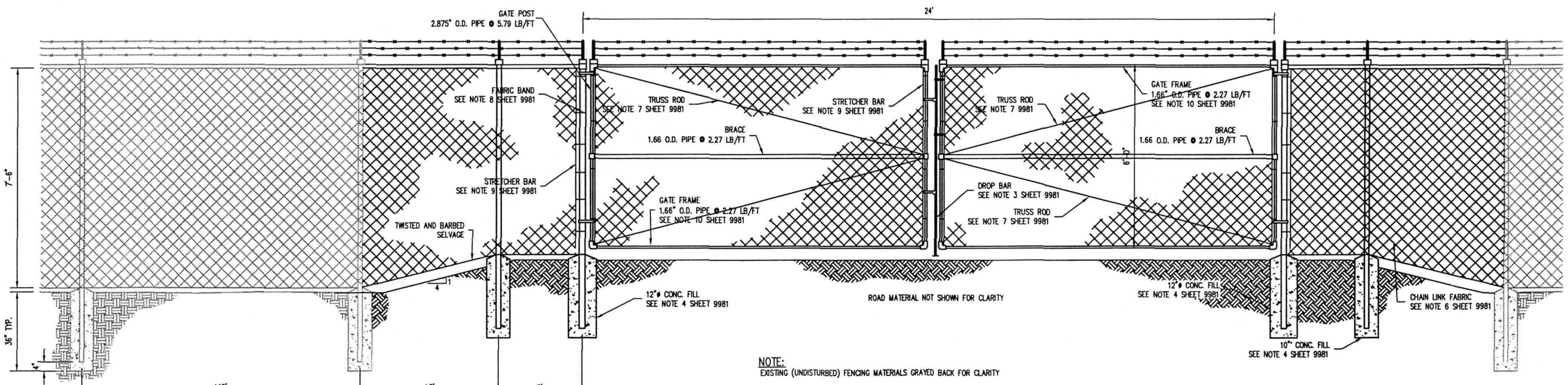


SOUTHEAST CROSSING PLAN VIEW

SCALE: 1"=50'

NOTE:
CROSSINGS TO BE INSTALLED BY MONTANA RAIL LINK

DETAIL (1) NTS RAILROAD CROSSING



NOTE:
EXISTING (UNDISTURBED) FENCING MATERIALS GRAYED BACK FOR CLARITY

DETAIL (2) NTS TEMPORARY FENCE & GATE ADJUSTMENTS AT NORTHWEST ACCESS ROAD EXISTING FENCE PENETRATION

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

REFERENCES DWG. NO.	TITLE

REVISIONS NO.	BY	DATE	DESCRIPTION

REVISIONS NO.	BY	DATE	DESCRIPTION

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DATE	

SCALE	AS-NOTED	
DRAWN BY	0072	8/25/00
CHECKED BY	SMY	8/28/00
APPROVED	MJO	8/31/00

MONTANA — MICHAEL J. OELRICH 9785PE — REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635
ASARCO INCORPORATED – EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
RAILROAD CROSSING AND FENCE PENETRATION DETAILS

N.Y. APPROP. NO. | PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9982 REV.

UPDATE TIME: 4:44PM
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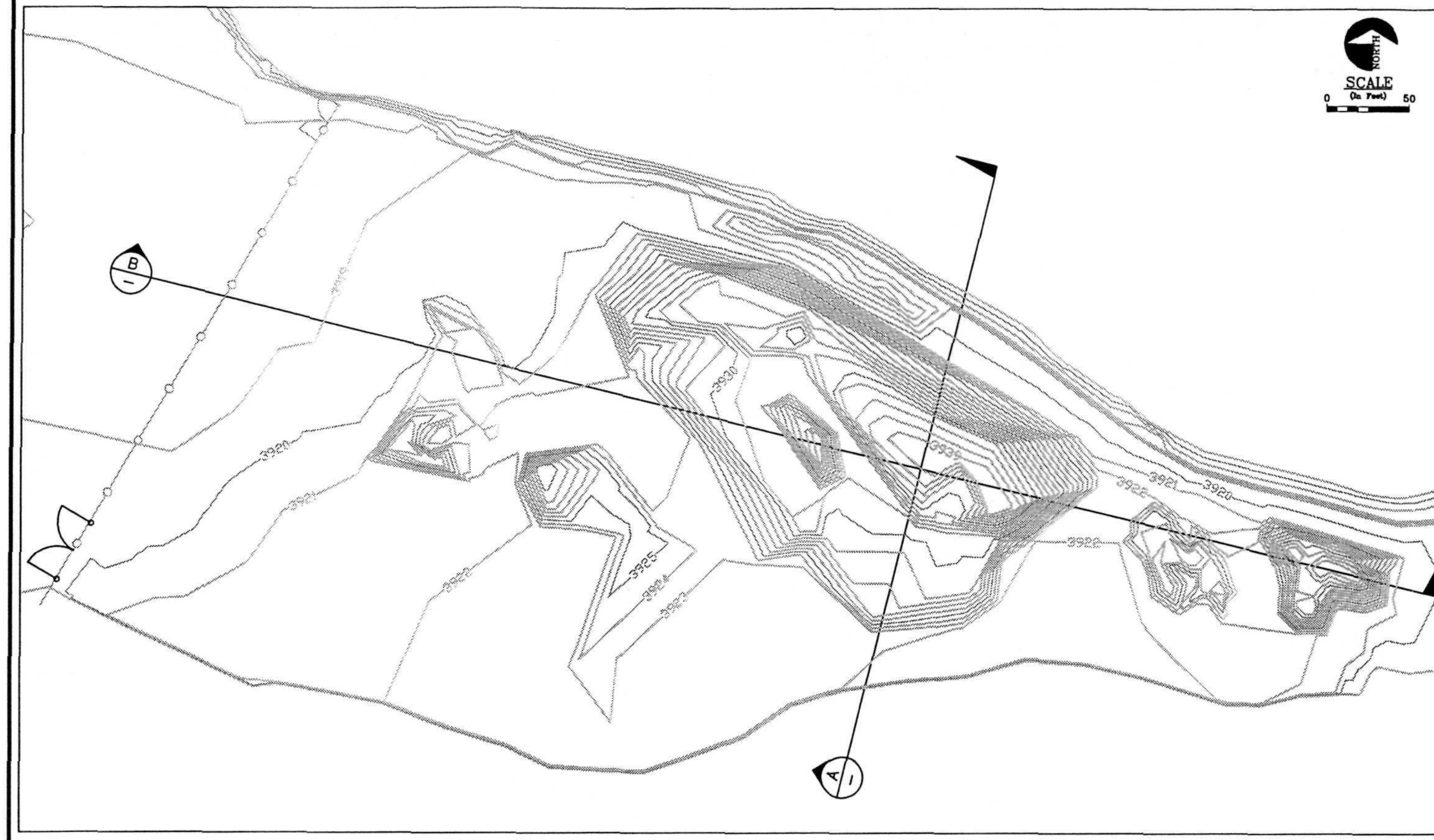
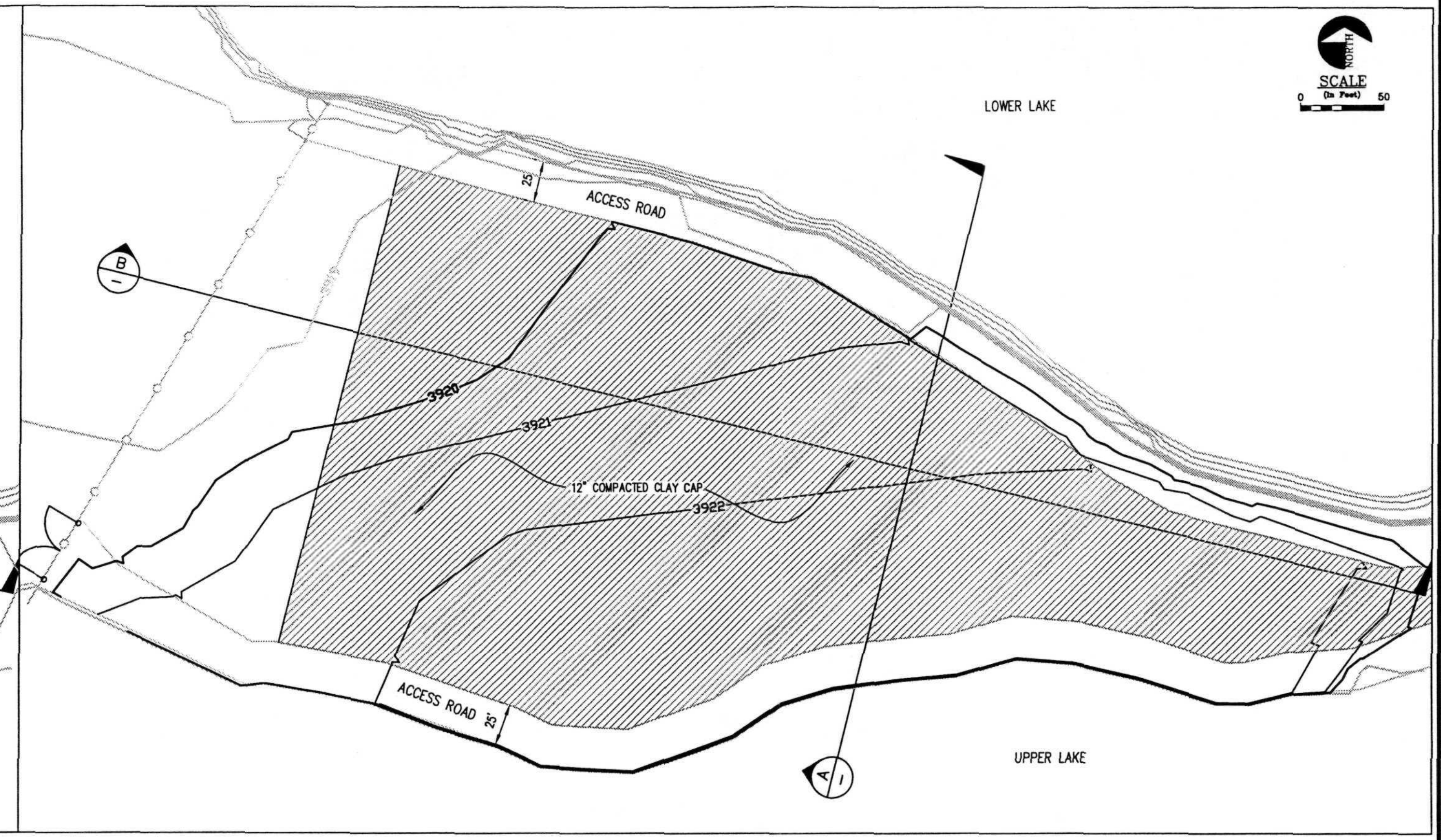


EXISTING SOUTHEAST LOWER LAKE PLAN VIEW

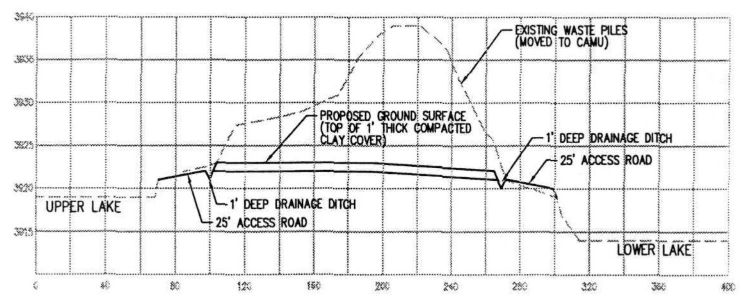
SCALE: 1"=50'



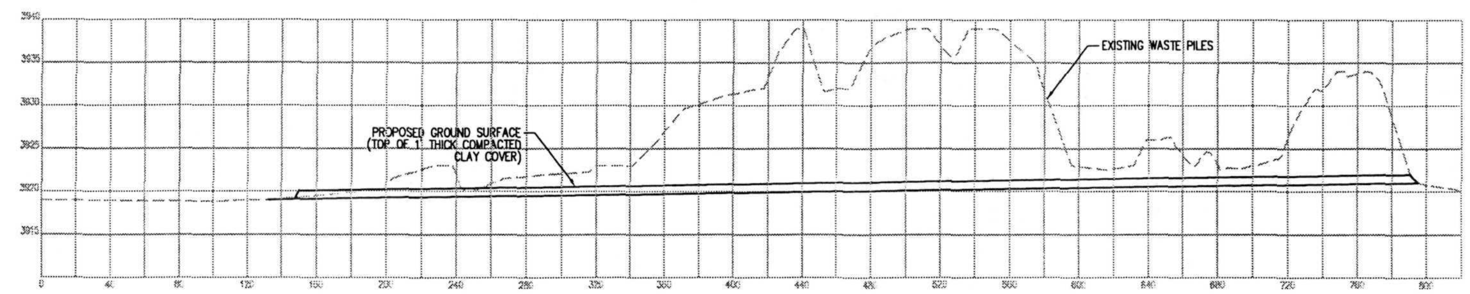
PROPOSED SOUTHEAST LOWER LAKE PLAN VIEW

SCALE: 1"=50'

NOTE:
FINAL GRADES TO BE STAKED IN FIELD AFTER EXISTING WASTE PILES REMOVED TO GROUND LEVEL.



SECTION A
SCALE: (H)1"=50' (V)1"=20'



NOTE:
GRADE AND COMPACT SUBGRADE TO 90% MAX. DRY DENSITY AT DEPTH OF 6" PRIOR TO PLACING CAP MATERIAL.

SECTION B
SCALE: (H)1"=20' (V)1"=50'

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

NO.	BY	DATE	DESCRIPTION
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ISSUED BY	
DATE	

SCALE	AS-NOTED	
DRAWN BY	0072	8/25/00
CHECKED BY	SMY	10/16/00
APPROVED	MJO	10/16/00

MONTANA MICHAEL J. OELRICH 9785PE REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated
EAST HELENA PLANT
EAST HELENA MONTANA, 59635

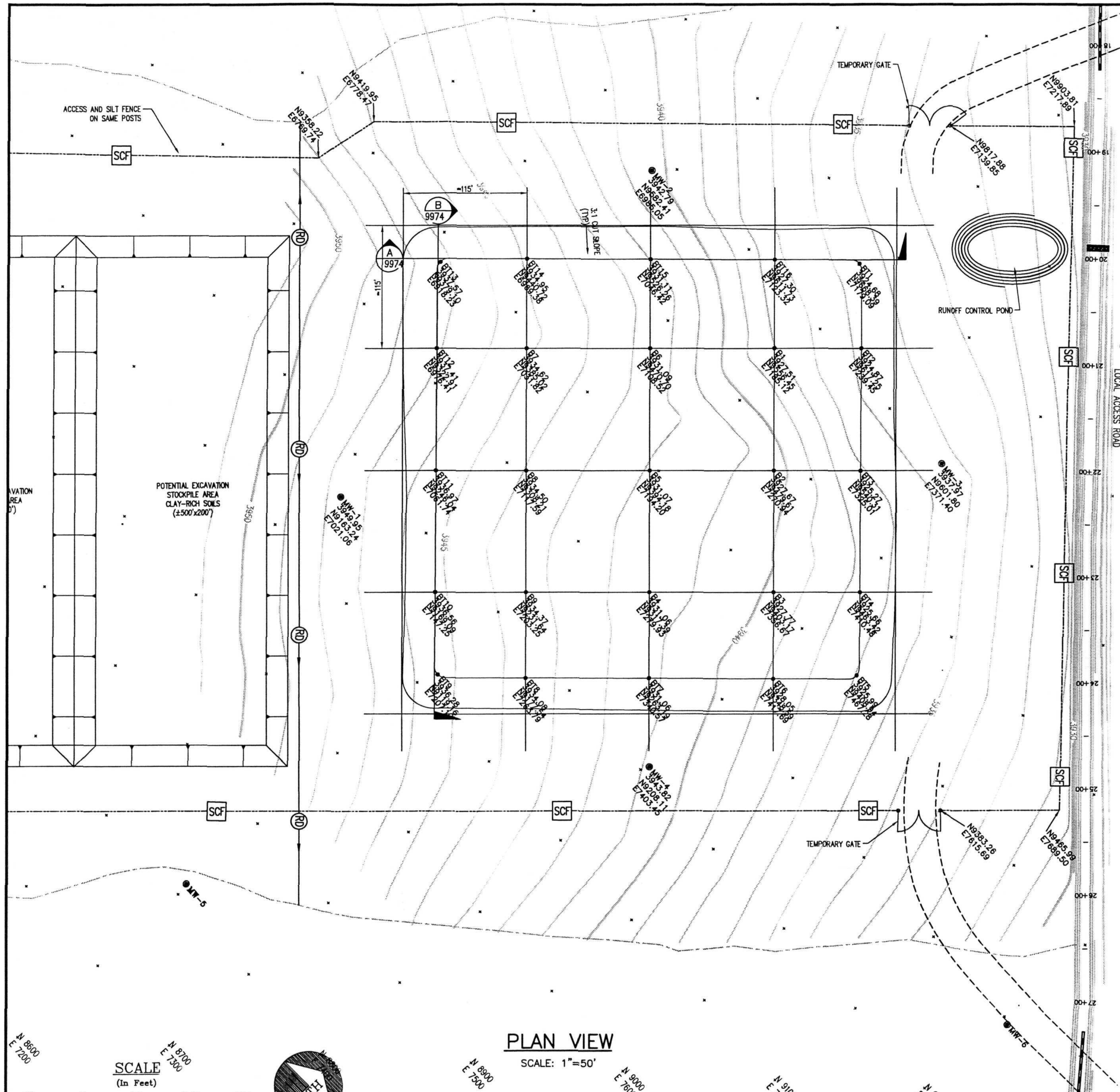
ASARCO INCORPORATED – EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
SOUTHEAST LOWER LAKE AREA
GRADING PLAN AND CAP SECTIONS

N.Y. APPROP. NO. | PLANT NO.

ASARCO

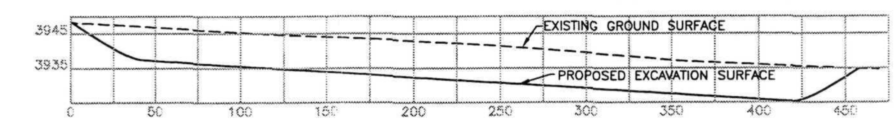
DRAWING NUMBER: 08-1-9983 REV. △

UPDATE TIME: 4:45PM
007\0127\065\0072\HEL\041201\I:\Land Projects\1270b201\DWG\12708201H014.dwg



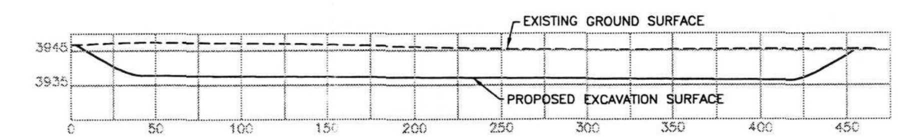
PLAN VIEW

SCALE: 1"=50'



SECTION A 9974

SCALE: (H) 1"=50' (V) 1"=25'



SECTION B 9974

SCALE: (H) 1"=50' (V) 1"=25'

COORDINATE TABLE — CONTROL POINTS

POINT	NORTH	EASTING	ELEV.	DISC.
MW-1	9163.2307	7021.2342	3950.040	MW ⊙ TOP CEN
MW-2	9582.4666	6985.3961	3942.880	MW ⊙ TOP CEN
MW-3	9601.9559	7371.4954	3938.060	MW ⊙ TOP CEN
MW-4	9207.8749	7403.5084	3943.910	MW ⊙ TOP CEN
RM-7	10553.2763	6833.3942	3929.860	BENCHMARK
BCPNW	9873.0502	7640.4701	3931.930	BERM CP-NW
BCPSE	9477.1059	7989.9466	3931.650	BERM CP-SE

COORDINATE TABLE — EXCAVATION POINTS

POINT	NORTH	EASTING	ELEV.	DISC.
BT1	9668.39	7179.09	3924.68	TOE
BT2	9617.25	7239.45	3924.87	TOE
BT3	9540.31	7325.01	3925.27	TOE
BT4	9463.42	7410.48	3925.66	TOE
BT5	9408.94	7467.28	3925.99	TOE
BT6	9348.59	7417.69	3928.05	TOE
BT7	9263.19	7340.57	3931.06	TOE
BT8	9177.54	7263.79	3934.08	TOE
BT9	9119.16	7207.10	3936.28	TOE
BT10	9169.09	7147.25	3936.56	TOE
BT11	9246.04	7061.74	3936.97	TOE
BT12	9322.91	6976.41	3937.41	TOE
BT13	9379.10	6918.23	3937.57	TOE
BT14	9440.72	6969.38	3934.95	TOE
BT15	9526.26	7046.42	3931.11	TOE
BT16	9611.73	7123.32	3927.30	TOE
B1	9556.45	7185.12	3927.51	BOTTOM
B2	9479.61	7270.94	3927.67	BOTTOM
B3	9403.17	7356.67	3927.77	BOTTOM
B4	9317.39	7279.93	3931.06	BOTTOM
B5	9394.18	7194.20	3931.07	BOTTOM
B6	9470.70	7108.52	3931.09	BOTTOM
B7	9385.02	7031.82	3934.62	BOTTOM
B8	9308.21	7117.69	3934.50	BOTTOM
B9	9231.64	7203.25	3934.37	BOTTOM

COORDINATE TABLE — FENCE CORNERS

POINT	NORTH	EASTING	DISC.
1	9903.81	7217.89	FENCE CORNER
2	9455.9	7689.50	FENCE CORNER
3	9383.26	7615.69	GATE POST
4	8527.74	6852.33	FENCE CORNER
5	8938.52	6388.56	FENCE CORNER
6	9358.22	6769.74	FENCE CORNER
7	9419.95	6778.47	FENCE CORNER
8	9817.88	7139.85	GATE POST
9	9903.81	7217.89	FENCE CORNER

Prepared By:
Hydrometrics, Inc.
Consulting Scientists, Engineers, and Contractors

REFERENCES

DWG. NO.	TITLE
9970	DRAWING REFERENCE LIST

REFERENCES

DWG. NO.	TITLE

REVISIONS

NO.	BY	DATE	DESCRIPTION
5			
4			
3			
2			
1			

REVISIONS

NO.	BY	DATE	DESCRIPTION
5			
4			
3			
2			
1			

PRELIMINARY
REVISED–DESTROY PREVIOUS ISSUE
RELEASED FOR CONSTRUCTION
ISSUED BY
DATE

SCALE	AS-NOTED	
DRAWN BY	0072	04/19/01
CHECKED BY	SMY	04/20/01
APPROVED		04/20/01

MONTANA — MICHEAL J. OELRICH 9785PE — REGISTERED PROFESSIONAL ENGINEER

ASARCO Incorporated

EAST HELENA PLANT

EAST HELENA MONTANA, 59635

ASARCO INCORPORATED–EAST HELENA PLANT
CAMU (RCRA LANDFILL) – PHASE I CELL
CONSTRUCTION LAYOUT
PLAN

N.Y. APPROP. NO. PLANT NO.

ASARCO

DRAWING NUMBER: 08-1-9984 REV.: △

UPDATE TIME: 9:58AM
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